DESIGNING THE ARMY'S FUTURE ACTIVE DUTY WEAPONS OF MASS DESTRUCTION RESPONSE: IS THE DEFENSE CHEMICAL, BIOLOGICAL RADIOLOGICAL, NUCLEAR AND HIGH-YIELD EXPLOSIVES RESPONSE FORCE (DCRF) THE RIGHT FORCE AT THE RIGHT TIME?

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

DESIGNING THE ARMY'S FUTURE ACTIVE DUTY WEAPONS OF MASS DESTRUCTION RESPONSE: IS THE DEFENSE CHEMICAL, BIOLOGICAL RADIOLOGICAL, NUCLEAR AND HIGH-YIELD EXPLOSIVES RESPONSE FORCE (DCRF) THE RIGHT FORCE AT THE RIGHT TIME? by Major Justin P. Hurt, 146 pages.

With the ever-evolving contemporary nature of external and internal threats to the safety and security of the American homeland, it becomes increasingly important to consider all of the possible contingencies for which an active-duty military component force might have to provide emergency response and consequence management (CM) capabilities in the event of a major incident on United States soil. The active force consigned for this purpose, designed to provide a large contingent for support during a major event involving the use of chemical, biological, radiological, nuclear or high-yield explosives (CBRNE) materials was designated as the Defense CBRNE Response Force (DCRF) per the CBRNE Enterprise of 2011. This purpose of this thesis was to examine the capacity of the DCRF in responding to a situation similar to the standardized scenarios presented as part of the National Preparedness Guidelines. The nascent nature of the DCRF and the difficulties of integration into national-level exercises involving local and state-level responders (including National Guard forces) suggest further study of the design of the DCRF is warranted. The DCRF itself is stood-up on a rotational basis between two Maneuver Enhancement Brigades (MEBs) within the United States, leading to long train-up times and challenges with continuity, collaborative training, and operational tempo. The study discussed these issues and suggestions for DCRF design, planning, and training that could significantly improve the ability to mitigate suffering and provide essential support in the event of a major CBRNE incident.

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ACRONYMS

AFRAT	Air Force Radiological Assessment Team
ARNORTH	U.S. Army North (U.S. Fifth Army)
BSI	Base Support Installation
C2	Command and Control
C2CRE	Command and Control CBRNE Response Element
CBIRF	Chemical Biological Incident Response Force
CBRNE	Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive
CB-RRT	Chemical-Biological Rapid Response Team
CDC	Centers for Disease Control and Prevention
CERFP	CBRNE Emergency Response Force Package
CM	Consequence Management
CCMRF	CBRNE Consequence Management Response Force
CRT	CBRNE Response Team
DCE	Defense Coordinating Element
DCRF	Defense CBRNE Response Force
DHS	Department of Homeland Security
DoD	Department of Defense
EMAC	Emergency Management Assistance Compact
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FM	Field Manual
FMD	Foot-and-Mouth Disease

HAZMAT	Hazardous Materials
HRF	Homeland Response Force
HSPD	Homeland Security Presidential Directive
JFHQ	Joint Force Headquarters (state National Guard)
JP	Joint Publication
JTF	Joint Task Force
JTF-CS	Joint Task Force–Civil Support
MEB	Maneuver Enhancement Brigade
NG	National Guard
NGB	National Guard Bureau
NGRF	National Guard Reaction Force
NIMS	National Incident Management System
NORTHCOM	United States Northern Command
NPS	National Planning Scenarios
NRF	National Response Framework
NSHS	National Strategy for Homeland Security
NSS	National Security Strategy
PDD	Presidential Decision Directive
QDR	Quadrennial Defense Review
RFA	Request for Assistance
TEU	Technical Escort Unit
TIC	Toxic Industrial Chemical
TIM	Toxic Industrial Material
WMD-CST	Weapon of Mass Destruction–Civil Support Team

TABLES

CHAPTER 1

INTRODUCTION

> Our enemies have openly declared that they are seeking weapons of mass destruction, and evidence indicates that they are doing so with determination. . . . History will judge harshly those who saw this coming danger but failed to act.
>
> — President George W. Bush
> *The National Security Strategy of the United States of America*, 2002

Background

The prospect of a weapon of mass destruction (WMD) detonating on American soil is almost unimaginable. This is not to say that it is not possible, but rather that it is too horrible to imagine the consequences of chemical, biological, or radiological contamination and the social, economic, and physical damage that could result. Vigilance and preparation are critical in readiness for a worst-case scenario where a WMD detonation, dispersal, or release exposes a large metropolitan populace that could affect a multi-jurisdictional, multi-state area. The United States Army has been training in chemical, biological, and radiological defense for decades, and in the years since September 11, 2001, the Army has enhanced the response capabilities of its chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) forces. In 2010, the Department of Defense (DoD) conducted a comprehensive review of CBRNE force structure, interoperability, and implementation in accordance with the *National Strategy for CBRN Standards* (Homeland Defense Subcommittee, 17). The resulting structural concept for the Army, dubbed the CBRNE Enterprise, included force allocation in the active and guard components.

One of the key new components of the CBRNE response posture for DoD was the activation of the active-duty Defense CBRNE Response Force (DCRF) in 2011 (Winnefeld 2011, 10). Despite being comprised of active-duty manpower, the DCRF works in concert with Army and Air National Guard forces supporting local and state responders in the event of a domestic CBRNE incident. In addition, as a Title 10 force the Secretary of Defense could theoretically use the DCRF for international response if directed by the President. However, the DCRF primarily responds domestically to an incident after twenty-four to forty-eight hours from notification (Reyes 2012), and only following a request for assistance from a state governor or another federal agency.

Even in a short period of time like two days, much can happen to affect the outcomes of those exposed to a CBRN release and the local and state response forces that come to the aid of local populations. Until 2010, this framework included the active-duty CBRN Consequence Management Response Force (CCMRF), a military CBRNE incidents support organization, under the command of Northern Command (NORTHCOM). The CCMRF, originally organized in 2008, was an organization envisioned to eventually number around 15,000 personnel (Vlahos 2012). As this force structure was determined to be problematic due to its size and the number of personnel it might divert from other critical or combat operations, DoD rolled the CCMRF mission into the 2011 design of the smaller active-duty DCRF in accordance with the CBRNE Enterprise concept developed in 2010. The DCRF is a federal military support, logistics, and response organization to supplement the local and state level responders in the event of an incident that might overwhelm local and regional capabilities.

As designed, the DCRF is a Brigade-sized element, consisting of some 5200 personnel deployable in up to two phases (Reyes 2012). It constitutes the active-duty military ready-response force for supporting state and local agencies in the event of a major CBRNE incident. Details regarding the DCRF organizational and deployment concept will be addressed later in this thesis. The majority of DCRF personnel are dedicated to providing logistics, decontamination, medical and administrative support to the incident commander, which remains under the direction of local or state responders during any defense support to civil authorities (DSCA) activation. This potentially leaves a gap in CBRNE response capacity, and active Army forces may be able to provide increased capability and faster response to a domestic incident outside the primary response of local or state authorities. However, as the primary active military support element, the DCRF does not have the decontamination, medical or command and control capacity to meet the response needs of the incident command within the critical first few days of a major national-level event.

The National Guard provides initial DoD response forces through a framework that includes the small, twenty-two person Weapons of Mass Destruction–Civil Support Team (WMD-CST), the company-sized CBRNE Enhanced Response Force Package (CERFP) and the larger, battalion-sized Homeland Response Force (HRF). However, not every state has an indigenous CBRNE force available larger than the WMD-CST. Interstate agreements known as Emergency Management Assistance Compacts (EMACs) allow National Guard commanders to request forces from other states in the event of a larger emergency (Emacweb.org 2013). If an incident extends over state borders, this

could complicate the response as governors retain control of their respective National Guard CBRNE forces unless the President federalizes these organizations.

Dall addressed the question of how the Army has organized forces for CBRNE response in prior research (Dall 2011, 5). As the active-duty military's primary contribution to domestic CBRNE incident support, the DCRF provides initial rapid deployment support capability to local and state responders in the event of a large-scale incident. This thesis will look at the capabilities of the military CBRNE response organizations in terms of decontamination, medical, and command and control (C2) capability and capacity, and determine the ability of the DCRF to support the needs of the incident commander adequately following a major event involving CBRNE materials. Through an analysis of the capabilities of the CBRNE forces available to the joint services, the author will address advantages and disadvantages of each force, the potential effectiveness of the active-duty DCRF response, and assessments previously performed on these formations. The author will also discuss the possible structures that may better meet the needs of a robust and flexible federal CBRNE response force in the event of a large-scale event that could extend past state borders.

This research concerns the preparation for and response to events that could have significant impacts on the economy and societal norms of the United States and our allies. In the current environment of fiscal restraint, it is also critical to address the impact of costs and an economy of force in dealing with CBRNE events through combining efforts, training, capability, and response organizations. An effective yet simpler joint force structure may be possible to reduce financial impacts while still maintaining rapid deployment capability.

Research Question

The capabilities of local responders, such as fire departments, hazardous materials (HAZMAT) units, and local emergency government organizations are oriented towards responding to incidents of a municipal nature; often this consists of determining what the largest toxic industrial chemical or toxic industrial material (TIC/TIM) risk is in the community and preparing the response element to mitigate that risk. Most fire department and HAZMAT operators do not have the necessary equipment to deal with even a moderate-scale CBRNE incident, such as a major train derailment carrying TIC/TIM. The local department would have to request mutual aid from an adjoining department or from state authorities. The state, through its emergency management plan and agencies, can often bring in the necessary elements to deal with a small-to-moderate scale industrial accident or CBRNE incident and can incorporate elements of the National Guard as necessary (Sidwell 2008). What is to be done when the incident is large, affecting a major metropolitan area or population center? In cities like New York or Washington, DC, where the metropolitan area extends over several states and countless jurisdictional boundaries, this may not be possible with the assets of one state or several through a multi-jurisdictional agreement. The DCRF brings in additional assets to support local and state responders in the event of a major incident involving CBRNE materials, but is this enough capacity to meet the needs of lower echelon responders?

Several additional questions that support this thesis are important in considering all the factors. What are the current organization, capabilities, and requirements of the Army CBRNE mission? Are the National Guard HRF and CERFP capabilities adequate until DCRF personnel and equipment arrive? What scenarios could initial responders,

HRF or CERFP encounter that would require more robust capabilities in less than forty-eight hours? What additional capabilities are mission critical or mission enhancing that are not a part of the current DCRF structure? How can the National Guard HRF, CERFP, and WMD-CST better integrate mission command and training with the active-duty DCRF, Marine Corps Chemical-Biological Incident Response Force (CBIRF) and Technical Escort Unit (TEU) CBRNE Response Teams to better prepare for joint responses and increase the ability to mitigate a major incident?

The author will discuss the structure of the layered responses that exist within the CBRNE Enterprise, incorporating local, state, and national level forces. Even the DCRF has limitations on what it can accomplish. The DCRF augments local and state responders after the local authorities launch an initial response and the incident commander determines it to be inadequate for the event, usually twenty-four to forty-eight hours after notification of the incident. In some scenarios, that may be too long a time to bring in adequate assets to be able to mitigate the incident, decontaminate the populace, and provide transportation and safe lodging for people in the affected area.

The DCRF is already a reduced-size element from its origins in the CCMRF of 2008. This thesis will outline the applicability and effectiveness of the DCRF in terms of structure, potential response scenarios, capabilities and limitations in acting as the active-duty military's primary CBRNE support and response organization. It will also include recommendations for the evolution of the DCRF into a more capable, effective force in providing consequence management (CM) assistance in the event of a major event.

Origins of Contemporary CBRNE Response and the CBRNE Enterprise

The impetus for a comprehensive system to deal with the consequences of a major CBRNE-type incident is nothing new. With the advent of the Biological Weapons Convention in 1972, and the Chemical Weapons Convention in 1993, the Army Chemical Corps shifted its focus to defensive measures and the development of lighter and more effective protective measures and more accurate and portable detection systems. Much of the technology in CBRNE detection equipment today arose from military applications required both for the defense of personnel and from the need to monitor and destroy the legacy chemical stockpile managed by the Army (of which 90 percent has been eliminated as of October 2011 [Uzumucu 2011]).

In accordance with this shift in focus for the Chemical Corps, the dissolution of the Soviet Union, and the potential for proliferation of weapons of mass destruction, DoD began to increase planning for response to a WMD incident in the homeland (DoD 1993). In 1996, the General Accounting Office stated in a report that the United States military forces were still largely unprepared and unprotected from the threat of even a medium-scale chemical or biological attack against the forces themselves, let alone against a population center (GAO 1996). This report highlighted that despite some developments in CBRNE defense since the 1991 Gulf War, there was not enough high-level emphasis and funding placed on increasing the training and capabilities of CBRNE forces in the U.S. military. President Clinton signed Presidential Decision Directive (PDD) 39, an initial outline of how the nation was to respond to terrorist acts domestically and overseas (White House 1995, 1). Clinton directed his cabinet to take action to reduce vulnerabilities, enhance counterterrorism capabilities, respond to terrorist acts, and

prepare for consequence management, and react to weapons of mass destruction incidents in the directive (White House 1995, 4-9). Congress subsequently passed the 1996 Defense Against Weapons of Mass Destruction Act (also known as Nunn-Lugar-Domenici) to appropriate funding for initial training and equipping of local and federal WMD hazards response organizations.

A significant shift in priority for CBRNE response soon followed. Marine Corps Commandant General Charles Krulak took an early step with the creation of the Chemical-Biological Incident Response Force (CBIRF) in April 1996 at Indian Head, Maryland (CBIRF 2013). This force, comprised of active-duty Marines from several occupational specialties, provides short-notice deployable personnel to respond to the credible threat of a CBRNE incident (Broyles 2009). As necessary the CBIRF detects and identifies CBRNE hazards, perform search, rescue, decontamination and emergency medical care of affected persons (CBIRF 2013). In past years, the CBIRF supported many high-level national events such as the Olympic Games, Presidential Inaugurations, State of the Union Addresses, and was part of the response to the 2001 Senate building anthrax contamination (CBIRF 2013). However, all of these efforts involved either pre-staging of the CBIRF or local support to other federal agencies. As a smaller sized force of approximately 500 Marines and Sailors, the CBIRF skill set and capability is applicable to small-scale incidents and as an initial response force for federal facilities and events (FM 3-11.21). The CBIRF continues to be an invaluable asset to the CBRNE response structure of the U.S. military, but it is limited in size and scope, currently consisting of two rapidly deployable sections of approximately 200 personnel each.

In 1997, the United States Army Soldier and Biological Chemical Command (SBCCOM) created a CBRNE coordination and response element called the Chemical-Biological Rapid Response Team (CB-RRT) to address the requirements for a no-notice management and technical expertise organization that could act as a go-between with responding federal agencies and military personnel (SBCCOM 2002). This organization, mandated per Public Law 104-201, Section 1414, operated out of SBCCOM's 24-hour operations center. It consisted of military and civilian employees able to use SBCCOM, military or commercial aviation assets to deploy quickly within the United States to provide technical assistance and contingency options to the incident command or responding federal authorities (SBCCOM 2002). It could also manage and coordinate the on-site operations of the CBRNE Response Teams of the TEU, Edgewood Arsenal technical experts, as well as other military organizations. These may have included the available WMD-CSTs, Explosive Ordnance Disposal (EOD), and the CBIRF (SBCCOM 2002).

IN 1999, DoD took significant steps to address response, command and control of responding forces by increasing CBRNE force structure. The Joint Chiefs established Joint Task Force–Civil Support (JTF-CS) to provide command and control primarily over Title 10 (active duty, reserves and federalized National Guard) personnel in the event state or federal authorities requested them (JTF-CS 2013). JTF-CS initially fell under the direction of the now-inactivated Joint Forces Command (Gray 2012). This standing joint task force comprised largely of active-duty personnel is able to deploy rapidly under the direction of NORTHCOM and is comprised of a standing staff with additional augmentation as required (DoD 2010) to command and control federal assets for

consequence management such as the DCRF and C2CRE. Its initial advance team deploys within four hours to begin planning for follow-on federal forces (NAS 2002). JTF-CS consists of a Fort Eustis, VA-based headquarters element with augmentation from the designated homeland CBRNE response force (the CCMRF prior to 2010 and subsequently the DCRF), medical, aviation, logistical, and signal forces. When activated, JTF-CS supports the local and state response forces in the event of a large-scale event as the main federal military support command and control element (JTF-CS 2012). Appendix A shows the task organization for JTF-CS as of 2012.

Also in 1999, the first ten WMD-CSTs formed and began training in response to President Clinton's PDD 39 (DHS 2012) and the 1999 Nunn-Lugar-Domenici legislation. Originally called Rapid Assessment and Initial Detection (RAID) detachments, the WMD-CSTs would grow over the next decade to a total of fifty-seven teams. The National Guard Bureau designated the first ten teams, certified in 2001, to operate as full-time Title 32 National Guard elements (Active Guard and Reserve) for their respective states. Over the next ten years, the National Guard Bureau authorized an additional forty-seven teams to cover every state (with California, New York, and Florida each fielding two), Puerto Rico, the U.S. Virgin Islands, Guam, and the District of Columbia.

The WMD-CST operates under the direction of the state Joint Force Headquarters (JFHQ) and provides a no-notice capability to respond to, conduct initial assessment and identification of potential CBRNE hazards, and provide advice to local officials (CST 2012). The WMD-CST is not a hazards mitigation, mass decontamination, or logistical support unit for an event involving WMD materials and cannot conduct explosives disposal operations. However, it does have an additional mission to respond to a natural

or man-made disaster, to prevent catastrophic loss of life or property, if so directed (Metcalf 2012).

The typical WMD-CST consists of twenty-two personnel on state active duty. The team is comprised of an operations element that directs the on-site operations, an administration element that addresses logistical needs, a communications element with a mobile satellite and communications suite, a medical element that includes a provider, and a survey element that conducts sampling and identification in the hazardous environment (Shenefelt 2007). On site, assigned collateral duty personnel from the various elements conduct decontamination of mission personnel (see Appendix B). The team will generally only deploy on the request of a local responding organization such as a fire, police, or HAZMAT department to a possible WMD or CBRNE incident (Metcalf 2012). The WMD-CST is the first level in the CBRNE Enterprise construct outlined in 2010 (Hessdoerfer 2011). Appendix G shows the locations of the 57 current WMD-CST units.

In 2003 SBBCOM reorganized and rolled the CBRNE personnel and response functions of the command into an organization that would shortly become the 20th Support Command (CBRNE) (Mauroni 2006, 230). The newly formed Chemical Analysis and Remediation Activity (CARA) and the WMD-Coordination Elements (WMD-CE) that became a part of the 20th Support Command (CBRNE) took over the CB-RRT functions. This action eliminated a standing comprehensive active-duty consequence management organization and split up its capabilities, although JTF-CS was able to manage consequence management command and control.

With limited federal consequence management assets and WMD-CSTs limited on personnel, capability, and availability, states required a more robust response organization to meet the requirements of the *National Military Strategy* in terms of supporting civilian consequence management. The Joint Chiefs directed the National Guard to develop a short-notice force drawn from traditional Guard personnel to be able to respond and supplement civil authorities in the event of a CBRNE incident (Dodson 2013), one that would carry more capability in the aftermath of such an event.

In 2004, ten states fielded a nascent CBRNE Enhanced Response Force Package (CERFP) that the state JFHQ had to create out of hide from traditional National Guard forces in the event of an emergency. This force consists of approximately 180 personnel per CERFP and the National Guard Bureau has designated manning of at least one per FEMA region (NGB 2009). The personnel come from existing units within the state's National Guard force, with federal funding for equipment and training. By 2007, the number of CERFPs had risen to seventeen (TX ARNG 2010). Through the system of inter-state mutual aid agreements, Emergency Management Assistance Compacts (EMACs), they could respond to neighboring states lacking a CERFP if requested by that state's executive and authorized by their home state (Dodson 2013).

The CERFP personnel pool theoretically consists of almost any type of unit or formation. As opposed to the WMD-CST, whose personnel are dedicated full-time to the CBRNE response mission set and were slotted accordingly, the CERFP is not a full-time force, nor dedicated solely to CM activities. If requested by the JFHQ, CERFP members have to muster quickly to be able to respond optimally in six to twelve hours from notification (DoD 2010).

Typically, the National Guard Bureau J357 evaluates the CERFP of a state every 18 months (NGB 2009). The unit consists of four sections (see Appendix C) that provide the capability to command and control the unit, conduct search, rescue and extraction of affected persons, decontaminate persons discovered in the affected area, and provide initial medical triage and treatment (NGB 2009). Of the 186 nominally assigned personnel, fifteen to sixteen are dedicated to command and control functions, fifty to search and extraction, seventy-five to decontamination, and forty-five to fifty to medical duties (WA JFHQ 2012), although this can vary slightly from state to state. The CERFP can also respond to assist following initial indications of a CBRNE incident by the WMD-CST (which cannot conduct mass decontamination or search and rescue of an affected population like a CERFP) (Sidwell 2008). As a more robust consequence management force, the CERFP is able to decontaminate approximately 450 people in a twelve hour period before turnover or rest is required (Hessdoerfer 2011).

This force falls under the control of the state JFHQ and is available for DSCA support (upon request to the JFHQ or with a declaration of the governor) anywhere within that state, or by EMAC to another state participating in that EMAC by request of the affected state's governor (Emacweb.org 2013). In the event that a multi-state event requires the participation of both state and federal forces, the CERFP when acting under state or Title 32 authorities would likely fall under the direction of a dual-status commander, who would exercise separate control simultaneously over both Title 32 and Title 10 forces (NORTHCOM 2012b). In addition, if the President declares a federal disaster and federalizes National Guard forces under Title 10, CERFPs can be task

organized under the direction of JTF-CS for consequence management. Appendix C shows the typical structure of a CERFP (Missouri NG's CERFP).

There is also an adjunct formation called a National Guard Reaction Force (NGRF) in every state that can provide state-level assistance to mitigate civil disturbances and protect key sites (NGB 2013). The state Adjutant General can designate this force to provide security and support for the CERFP and WMD-CST in the event additional force protection is required (NGB 2013). This would not violate laws governing the use of military force in law enforcement duties (Posse Comitatus Act, 18 U.S.C. Sec. 1835) as it is a state-controlled or Title 32 force in that role. The eventual combination of a regular security force with the CERFP capability later evolved into the HRF construct, which will be discussed later.

In 2008, Secretary of Defense Robert Gates called for the creation of a hybrid active-reserve force called the CCMRF. The first CCMRF was fielded in 2010 primarily with active forces to respond to an incident after ninety-six hours (LeJeune 2010, 4) and a second reserve-manned CCMRF was to be ready for fielding in 2011 (eventually followed by a third reserve component CCMRF element). After the initial training of two CCMRF elements, the Army elected instead to field a single, active-duty CCMRF response element which was to respond in two waves: a smaller force with approximately 2000 personnel in twenty-four to forty-eight hours and a second wave of approximately 3000 personnel in forty-eight to seventy-two hours (LeJeune 2010; Reyes 2012). With this change, the formation of the current CBRNE Enterprise concept began, and would incorporate the WMD-CST, the CERFP, and later the HRF. It would also include the successor to the CCMRF, which would become the DCRF and the Command and Control

CBRNE Response Elements (C2CREs). Secretary of Defense Gates would also phase out the reserve component CCMRFs in favor of the subsequent development of the Homeland Response Force (HRF) in ten states' National Guard forces (LeJeune 2010, 4). The HRFs would go to California, Georgia, Massachusetts, Missouri, New York, Ohio, Pennsylvania, Texas, Utah, and Washington (Hessdoerfer 2011).

Starting in 2011, the development of ten HRFs began, each element consisting of approximately 560 personnel each. In nine states (with Utah the exception) the HRF grew from the existing CERFP in that state. Eight of the seventeen CERFPs that already existed remained allocated as-is to their respective states, and each continued to carry approximately 180 personnel (Reyes 2012). National Guard Bureau allocated the ten HRFs based on a factor of one HRF per FEMA region (LeJeune 2010). Except in Utah, the state's CERFP became an HRF by increasing the force strength (also drawn from traditional Guard members), equipment, and capability to cover the additional mission security and enhanced command and control (LeJeune 2010). The Secretary of Defense Gates funded the National Guard Bureau to backfill the nine transitioning CERFPs and these went to fill states that did not already have a CERFP, with an additional one in Puerto Rico. The HRF was a combination of the original CERFP structure with the addition of a 200 person security element. The HRF also has a more robust Brigade-level command and control team of 180 personnel that can coordinate with other regional assets (WA JFHQ 2011), including any additional CERFP assets that may be responding through an EMAC request (see Appendix D).

The HRF, with the addition of 380 personnel to the CERFP structure, is able to provide more site security, infrastructure protection, control of follow-on units,

coordination with civil services, and reach back with subject matter experts. Like the CERFP, the HRF responds within six to twelve hours of notification (Hessdoerfer 2011). With a much larger contingent of personnel, it is more likely that a small force would deploy initially, followed by the preponderance of personnel sometime after the six to twelve hour window. However, it should be noted that the HRF goes beyond just CBRNE response to include the function of homeland defense (such as in the case of civil disturbance, natural disaster, and humanitarian assistance needs) and can respond to any event that could affect homeland security or require significant recovery efforts. In addition, the HRF is able to command and control several subordinate response units as required, including the incorporation of additional WMD-CSTs and CERFPs from other states in accordance with an EMAC request (TX ARNG 2010). The breakdown of an HRF organization can be seen in Appendix D. The end state layout of all CERFP and HRF elements within the United States can be seen in Appendix I. This diagram shows that the FEMA regions are covered by at least one CRFP and one HRF each, but that twenty-four states are not covered by either force (Hessdoerfer 2011). In the event of a major incident, a state without a CERFP or HRF would either have to request assistance through an EMAC if another states' force was available (and not dealing with the disaster itself) or federal assistance.

Coinciding with the implementation of the CBRNE Enterprise concept, in 2011 the active-duty portion of the CCMRF became the DCRF. The DCRF consists of a base Brigade-sized unit, augmented with additional enablers. Currently built around one of two active-duty Maneuver Enhancement Brigades (MEBs) in the United States Army, the DCRF is intended to take advantage of the tailorable nature of this type of Brigade and its

multifunctional staff (Van Camp 2012, 19). Consisting of a Brigade headquarters, a logistics-centric Brigade Support Battalion, a signal company and an additional support company as its only organic assets, the MEB also may have several other types of battalions attached to it depending on the requirement.

The current MEB assigned to the DCRF mission, 1st Maneuver Enhancement Brigade of Fort Polk, LA, carries an organic engineer battalion and a military police battalion (1st MEB 2013). This structure provides elements to conduct engineering tasks for search and rescue and security operations, but it is not specifically tailored for CBRNE response. As a CBRNE response force, the DCRF has a chemical battalion under its operational control for the duration of its assignment for CBRNE missions but this battalion is not co-located (JTF-CS 2012). It also has other enablers as required, such as additional signal elements, an Air Force Radiological Assessment Team (AFRAT), and additional medical assets (JTF-CS 2012). Like the chemical battalion, these additional elements come from other units or installations, presenting challenges for coordinating collective training and deployment efforts. As many of the units that make up the DCRF are in locations all over the country (JTF-CS 2012), building capacity in the event of a major incident is concern. Appendix E outlines the potential task organization of the MEB as part of the DCRF.

Appendix F includes the locations of Maneuver Enhancement Brigades across all components in the Army. There are only two active component MEBs in existence that can be task organized for the DCRF mission; the remaining MEBs are in the reserve component, and not available on the required DCRF response schedule of twenty-four to forty-eight hours. This means that the core DCRF mission must rotate annually between

1st MEB at Fort Polk, Louisiana and 4th MEB, located at Fort Leonard Wood, Missouri (Van Camp 2012, 25). With only two active MEBs available, this increases the training requirements and operational tempo of these two units as the Army Forces Command commander can assign them to other requirements when not assigned to the DCRF mission.

The DCRF carries a complement of approximately 5200 personnel that are available in two deployment phases. The first phase consists of approximately 2000-2100 personnel that respond to the request for assistance (RFA) to a major incident within twenty-four hours from notification. This contingent conducts initial response activities, coordination for follow-on forces, and establishes the DCRF footprint at the designated base support installation (BSI). A second phase consists of 3100-3200 personnel that deploy at forty-eight hours after notification. This phase may include additional enablers, personnel with special types of equipment, or forces that were required to respond from remote locations (Hessdoerfer 2011).

The DCRF carries many of the same functions as the CERFP and HRF, albeit in a much more robust package. In addition to C2 functions, search and rescue, decontamination and basic medical triage support, the DCRF also brings an enhanced medical treatment capability with the potential for level II and III medical and surgical access, additional engineering and logistics assets, transportation, ground MEDEVAC and CASEVAC, and aviation lift and MEDEVAC (Brown 2013). These units are not co-located with the MEB, increasing the requirement for planning and coordination to ensure an effective deployment to the incident or BSI (JTF-CS 2012). The decontamination capability of the DCRF is significantly higher than in the CERFP or

HRF at approximately 2700 persons in a twelve hour period before turnover or rest is required (Hessdoerfer 2011) but the number of trained personnel available in the DCRF still limits the capacity of the element to decontaminate victims in a large-scale event. When activated, the DCRF optimally falls under the control of JTF-CS, which will control all active duty forces responding to the event (JTF-CS 2012). This JTF, headed by a two-star general or flag officer, will also typically deploy to a BSI to establish a command post.

NORTHCOM has designated a follow-on force called the Command and Control CBRNE Response Element (C2CRE) to deploy at notification plus ninety-six hours (in the event the incident commander needs further assistance). Also under the command of a two-star general or flag officer via Joint Task Force–51, the C2CRE is an additional group of approximately 1500 personnel with similar functions to the DCRF, but is more ad-hoc in nature (Gray 2012, 5). It is not specifically organized and trained together like the DCRF but rather drawn from multiple sources if needed. The C2CRE has a second function to support non-CBRNE DSCA requirements as well as following the DCRF for CBRNE incidents. Divided into two C2CRE elements, A and B, this force is essentially the first follow-on support that would deploy to the incident in the event the DCRF or incident management needed additional resources beyond that already present (Gray 2012, 50). With two C2CREs, there is the availability for two additional force packages or for support to two simultaneous events. Both of these C2CRE elements fall under a separate two-star level JTF headquarters which is also capable of directing any additional Title 10 forces that come to bear on the situation, be it CBRNE related or otherwise (Hessdoerfer 2011). However, these forces deploy from multiple locations and do not

habitually train together, limiting their capacity to provide critical support quickly in the event of a major incident that might necessitate rapid response, decontamination, or medical care.

The Weapons of Mass Destruction-Civil Support Team is the lowest echelon military response element, followed by the National Guard CBRNE Enhance Force Package and Homeland Response Force at the state level. Federal level active-duty response organizations consist of the Defense CBRNE Response Force followed by the Command and Control CBRNE Response Element. Joint Task Force-Civil Support acts as the military command and control headquarters for the federal forces. Together, all of these forces comprise the CBRNE Enterprise. Appendix G illustrates the entire framework of the CBRN Enterprise with each element's expected response timeframes.

The National Guard Bureau has established and exercised the WMD-CST and CERFP for nearly a decade, but the HRF and DCRF structures are still relatively new. The HRFs only conducted initial validation during the build-up of the ten state units. The DCRF only conducts validation in an annual certification exercise named Vibrant Response (Van Camp 2012, 24). Although training and exercises happen at the local or state level for these forces, they get limited exposure to large-scale exercise scenarios involving the myriad civil authorities players they would likely encounter in a major CBRNE incident. This is especially critical for the DCRF, which is the active-duty support force for CBRNE, expected to be able to deploy anywhere within U.S. territory and deal with any number of potential civil services organizations, non-governmental organizations, and state and local officials.

Assumptions

This thesis research presumes that the structure of the United States armed forces with respect to CBRNE response and assistance has not changed substantially due to budgetary constraints (such as the impending 2013 budget "sequestration"), other international obligations, or a major CBRNE incident. This thesis cannot address the specific long-term economic costs of a large-scale event on the local or national economy. The CBRNE scenarios discussed herein do not take into account effects compounded by natural disasters or terrorist action that might further hinder or occupy response elements separate from organizing and responding to the CBRNE aspect of an event. Such a potentiated event might outstrip the available assets even further beyond the intended capability of the response force and cannot be anticipated in the focus of this research. In addition, this thesis presupposes that in the event of a large-scale event, the responders would act within the scope of their training and role, and not be utilized for a purpose outside of their mission set (i.e. for a non-CBRNE response role) thus further limiting the effectiveness of the response element. Accordingly, response elements would also be acting in agreement with applicable law and regulation, and would not be used in a manner that violates the Posse Comitatus Act or other legal restriction on the use of military forces (18 U.S.C. Sec. 1835). The organizations discussed in this thesis must be capable of conducting their operational mission at a minimum of 90 percent strength. This thesis also does not include data on the effect of psychological strain on local or regional capabilities or responders whose families might be affected by CBRNE events.

Scope and Limitations of Study

The author limited the scope of the thesis as it will only deal with the structure of the DCRF (and to a smaller extent the National Guard CERFP, HRF, and WMD-CST, the active-component TEU, and the Marine Corps Chemical Biological Incident Response Force (CBIRF) as an associated element) and their capabilities, strengths, weaknesses, and potential interactions. The author will address the DCRF as it exists following the reorganization of the CCMRF in 2011 into the active force component and the National Guard-based HRFs. The author also limited the thesis as it will only address the ability of these forces to respond under the auspices of DSCA and commander's support to local authorities. The author will not substantially discuss the capabilities or response structure of any local, state (other than National Guard) or federal agency in a WMD or CBRNE incident, except the potential role of the CBRNE Enterprise elements in assisting these elements in the event they are unable to shoulder the incident or request federal assistance from the Army. This thesis only addresses the potential for an alternative response framework based on the available forces at the end of 2012. It will not include the potential for further force reductions as a result of budgetary constraints or Quadrennial Defense Review (QDR) changes. In addition, this analysis does not address the CBRN component of Special Operations Forces (SOF). Although SOF capabilities could be useful in a CBRN task force structure and their concurrent training with conventional CBRNE response forces might be appropriate, their geographic orientation and nature of mission prevents their inclusion. In addition, the documentary research conducted for this study was through open-source channels to allow this document to remain unclassified and unrestricted for distribution. The inclusion of

classified documentation, although it might be informative and enhancing, would severely limit the potential audience for this research.

Delimitations

The author will limit this thesis primarily to the utilization of the DCRF in responding to incidents of a large scale–one that affects a large population center or metropolitan area. The Department of Homeland Security's (DHS) National Planning Scenarios (NPS) provide the example scenarios for this thesis. They are a series of response planning guidelines enacted as a result of 2003's Homeland Security Presidential Directive-8 (White House 2003b). Although there likely are very good scenarios designed at the local or state level that could be considered, the DCRF would respond almost exclusively to an incident of national interest and include federal adjuncts from the Federal Emergency Management Agency (FEMA) and associated organizations.

Significance

Per the organization of the CBRNE Enterprise, the DCRF is the highest-level ready-status force for CM available from the Department of Defense. The structure of the CBRNE Enterprise has the DCRF responding optimally at twenty-four to forty-eight hours from incident zero-hour (Hessdoerfer 2011). Should the incident be of a massive scale, such as might be possible with the detonation of a nuclear device or the outbreak of a highly contagious etiologic infection, it would require rapid response with a large contingent of trained and ready personnel. Such an event would have national-level, possibly global implications and would require immediate containment and mitigation. The author seeks to determine the efficacy of the DCRF as a response and support

element in such circumstances based on its current structure and capabilities. The interoperability of the DCRF with other responders, including the National Guard forces and local responders is critical to avoiding delays and complications in dealing with a major incident. This interoperability has implications for training and coordination between local, state, and federal agencies. The importance of this study is to determine the ability of the DCRF, in concert with the other CBRNE Enterprise elements, to address the needs of local, state, and federal officials in rapidly responding to and assisting with CBRNE incident mitigation and support in order to alleviate suffering and return the situation to stability as soon as possible. Should the research show that the DCRF does not have the capacity to respond effectively as designed and trained, it could suggest that additional resources may be necessary to accomplish the intended mission set or that a new structure is appropriate for such a mission? Alternatively, it may also show that the mission might be better handled by a different organization or agency.

Summary

Through analyzing the structure and capabilities of the components of the DCRF in concert with other CBRNE Enterprise response elements, this research will concentrate on the efficacy and applicability of the DCRF as organized against scenarios as drawn from the NPS. By placing emphasis on determining the appropriate response timing, types of military elements, training and technical capabilities suitable for several scenarios, the analysis will establish if the DCRF addresses these requirements, and if it has the capacity to provide the appropriate response in the critical few days following a major incident. Through a review of available documents, comparisons between the various types of response elements and the application of each type of element to various

response stages in the given scenarios, it will be possible to view the strengths and weaknesses of the CBRNE response components and where the DCRF would be best suited for integration into the response framework, be it as designed or under a modified framework or structure.

CHAPTER 2

LITERATURE REVIEW

Introduction

In order to understand the concept behind CBRNE force implementation in response to a declared emergency, it is first necessary to understand some of the history, prior research and publications behind the CBRNE Enterprise. This includes the structure of the forces involved, how the DoD and state headquarters utilize them, and the doctrine and policy that governs them. Of importance is the impetus behind creating active-duty forces such as the DCRF to support lower echelon responders.

Prior to the events of September 11, 2001, WMD incidents, although always a potential threat, were largely isolated to fringe elements that executed effects upon civilian populace targets with limited success (such as the Aum Shinrikyo Cult) (Dall 2010, 41). With the advent of a growing threat from state actors like Syria and North Korea and non-state actors including the influence of *Al Qaeda*, this changed - an organization emerged that had truly global reach and a dedicated following including technical and technological expertise. This necessitated a change in thinking regarding our response mechanisms to a potential WMD release.

The first step taken by the United States Government was to increase funding to local and state governments through FEMA grants and the development of domestic preparedness facilities utilizing former military training sites (DHS 2012). Although the ramp-up in domestic CBRNE training began in 1996 following the implementation of Presidential Decision Directive (PDD) 39 (White House 1995), funding increased significantly with the advent of the Office of Homeland Security in 2002, which later

became the DHS. Some of the history of how the CBRNE Enterprise and the DCRF evolved from this will be discussed here, as well as the prior literature on the growth of the CBRNE Enterprise, creation of the DCRF, and the value of these organizations.

Areas of Literature Review

This literature review will be done in several parts. The first part is a review of the documents and policies that affect national counter-CBRNE strategy and military response to CBRNE incidents under Defense Support to Civil Authorities (DSCA), as that is the process by which the President or the Secretary of Defense authorize activation of a federal force to an incident in the homeland. The second part is an overview of the National Response Framework, the FEMA document that serves as a planning guideline for responding to a major incident (including CBRNE). Associated with the NRF are the National Preparedness Guidelines (NPG) and a series of event scenarios called the National Planning Scenarios (NPS) that help local, state, and federal authorities anticipate response requirements for a large-scale event. The third part is an analysis of prior literature and research on the subject of the CBRNE Enterprise, how it relates to the thesis and what gaps exist in prior studies.

Documents and Policies Regarding Federal Military Response to CBRNE

In the build up to the current CBRNE Enterprise and following the events of September 11, 2001, President George W. Bush established the first full-length *National Strategy to Combat Weapons of Mass Destruction* (White House 2002a). In this plan, President George W. Bush established the basic tenets for domestic and foreign counter-WMD operations and CBRNE response concepts, although it did not prescribe any

particular force structure at the time. Rather, he placed initial emphasis on the training of local responders and preventive measures for counter-proliferation, in much the same way that Nunn-Lugar-Domenici had tried to do in the late 1990s (50 U.S.C. Sec. 2301, 1996). The President outlined an approach for countering the threats of WMD through counter-proliferation, nonproliferation, and consequence management concepts, but did not specify a particular methodology concerning the implementation of any of these areas (White House 2002a, 6). Bush did charge the executive departments, including the nascent Office of Homeland Security (later to become the DHS) to provide support to state and local entities in planning and preparing for WMD attacks (White House 2002a, 5). However, the NSCWMD did not include any directives regarding the use of the active military or framework for the activation of any federal forces in the event of a CBRNE incident.

Shortly thereafter, President George W. Bush published his initial 2002 *National Strategy for Homeland Security* (White House 2002b), calling for a significant change in the emergency preparedness and response structures of both regional and federal authorities. Two of his twelve major initiatives involved the armed services: to "prepare for chemical, biological, radiological, and nuclear decontamination" and "plan for military support to civil authorities" (White House 2002b, x). In addition, he called for implementing "a national incident management system," in the strategy, which would come to be known by its acronym "NIMS." In the NSHS, President Bush built upon his guidance in the NSCWMD by giving instructions to DoD to contribute to homeland security through support to civil authorities and through involvement "during emergencies such as responding to a CBRNE attack or to forest fires, floods, tornadoes,

or other catastrophes" (White House 2002b, 13). DoD might be asked to act quickly to provide some capabilities that another agency or authority lacked. CBRNE response would be a good example, as local or even regional CBRNE assets could be very limited, especially in trained responders or equipment (White House 2002b, 13). In this way, the President could call up federal forces to assist local and state authorities under DSCA, a framework that would eventually include the growing National Guard consequence management forces and the DCRF.

Ultimately the NSHS gives further detail on the two major initiatives affecting military response that will require a "total response" approach. This approach requires joint effort with the establishment of the new NORTHCOM in April 2002 under a revised Unified Command Plan, giving the primary responsibility for civil support in the homeland to NORTHCOM (White House 2002b, 44). This essentially codified the legislation of Nunn-Lugar-Domenici, in which Congress directed DoD to coordinate assistance to officials at every level in responding to CBRNE threats. This included "assistance in identifying, neutralizing, dismantling, and disposing of nuclear, radiological, biological, chemical weapons, and high-yield explosives and related materials and technologies" (50 USC 2313). The combination of the 2002 NSHS and prior legislation provided a pathway for NORTHCOM to organize a federal response plan for major domestic incidents, which would involve the DCRF starting in 2011. However, the 2002 NSHS did not directly address military structures or command relationships in civil support. This would be accomplished later in the *National Military Strategy to Combat Weapons of Mass Destruction* (DoD 2006) and doctrinal publications (United States Army 2012).

President George W. Bush followed this up with Homeland Security Presidential Directive 5 (HSPD-5), which directed the Secretary of Homeland Security to create and manage the National Incident Management System (NIMS) that the President mentioned in the NSHS (Dall 2011, 11). In this document Bush also directed all federal agencies and the military services to adopt NIMS as a baseline standard for coordinating federal response to an incident, whether it involves CBRNE materials or not (White House 2003a, 282). By developing NIMS as a uniform system and encouraging its use by state and local responders through the standardized Incident Command System (ICS), this framework increased interoperability between organizations and agencies at all levels. DHS issued NIMS in March 2004 (DHS 2008a, i) to bring together established concepts of incident command functions into one system that could be implemented across all federal functions, and subsequently at the state and local level. Through NIMS, President Bush provided a guideline for response coordination and support, but HSPD-5 did not include detail on how NIMS would be adopted in a CBRNE-specific situation nor how it would be incorporated by a state military force (such as the HRF) versus a federal military force like the DCRF.

Bush included the armed services in his requirement to utilize NIMS, but did make the distinction that the concept of unified military command differed from the concept of unity of command as it applies to civil authorities (DHS 2008a, 48). This is not an issue as military forces deploying to support civil authorities under DSCA would follow a military commander that was acting in a supporting role to the state and local incident commanders and thus the military chain of command would remain essentially intact and under civilian control. It is important to note that in DSCA functions, the

federal military responders may in fact follow the "tactical" instruction of a local or state level response manager for limited periods of time (as tasked by their chain of command) but that military command, and its associated administrative functions would remain with a military officer. NIMS is intended as a guideline for facilitating coordination with shared understanding and incident management functions, not as a task organization concept for military operations (DHS 2008a). For example, the commander of the DCRF would continue to organize troops as required for supporting the overall incident response effort, but would plug his or her staff into the overall response management through the DCE (Schlafer 2013).

In 2004, the Joint Chiefs of Staff determined that local responders were much better trained for smaller or localized responses to TIC/TIM type events and small releases of hazardous materials, but they were undermanned for large-scale responses to domestic incidents (DoD 2004, 10). With combating WMD as one of the pillars of the Joint Chiefs of Staff's *National Military Strategy for the United States of America* (NMS) in 2004, the Joint Chiefs of Staff defined a role for National Guard and active forces in preparing for defensive actions in the homeland (DoD 2004, 15). This included protecting critical infrastructure as needed, defense against terrorist aggression, and temporary employment of military capabilities to support law enforcement during special events. Specifically, the Joint Chiefs directed that,

> During emergencies the Armed Forces may provide military support to civil authorities in mitigating the consequences of an attack or other catastrophic event when civilian responders are overwhelmed . . . that integrates the unique capabilities of active and reserve military components and civilian responders. (DoD 2004, 10)

In addition, the Joint Chiefs envisioned that this would "require the exploitation of future technologies to improve capabilities to rapidly detect, assess and interdict WMD and emerging threats" (DoD 2004, 10). In the NMS, the Joint Chiefs established reasons for incorporating reserve and active forces in domestic consequence management response but did not specify the capabilities or capacity of those forces.

In the 2011 update to the *National Military Strategy for the United States of America*, the Joint Chiefs further identified the role of the military forces in combating WMD to include specific threat regions in Asia and the Middle East, speaking to the need to defeat such weapons before they reached non-state actors or the shores of the nation (DoD 2011b, 3), but this did not outline the specific role of active forces in consequence management, nor did it indicate the intended capacity of such forces. However, in the 2011 NMS, the Joint Chiefs explained that DoD would "continue to dedicate, fund and train a portion of the National Guard for homeland defense and defense support of civil authorities" (DoD 2011b, 11).

Following the original 2004 NMS and the 2002 *National Strategy to Combat Weapons of Mass Destruction*, the Joint Chiefs outlined a WMD-specific strategy for WMD and CBRNE response, mitigation and elimination. In the *National Military Strategy to Combat Weapons of Mass Destruction* (NMSCWMD), the Chairman of the Joint Chiefs of Staff, General Peter Pace, laid the groundwork for utilizing the Army and Marine Corps' CBRNE personnel in DSCA functions (DoD 2006) as well as defining the roles that DoD forces would have in combating WMD at home and abroad. Utilizing an ends-ways-means approach to defining the lines of effort for combating WMD, General

Pace defined two critical “ends” or strategic goals that would affect the execution of DSCA as it would apply to the services:

1. If WMD is used against the United States or its interests, U.S. Armed Forces are capable of minimizing the effects in order to continue operations in a WMD environment and assist United States civil authorities, allies and partners.
2. Allies and U.S. civilian agencies are capable partners in combating WMD (DoD 2006, 5).

This meant that military involvement in DSCA required personnel effort and planning input on the military and civilian side. General Pace further directed that the “U.S. Armed Forces must be prepared to support the response to a WMD event in the homeland and, when directed, support allies and partners” (DoD 2006, 8). Pace then defined the applicable “ways” or strategic objectives to meet these ends as being through the efforts of “protect, respond and recover,” including passive defense measures and CM activities, which are two of the eight mission areas defined in the NMSCWMD. Finally, Pace defined the “means” or enablers as those military elements (through U.S. Strategic Command for counter-WMD and NORTHCOM for homeland defense and response) that could be resourced to conduct CM activities, such as National Guard troops or active duty forces (DoD 2006, 6). For passive defense, this included the four key capabilities of “sense, shape, shield and sustain” (DoD 2006, 25) to detect, warn, protect, and operate as necessary through a CBRNE environment.

For consequence management this was the impetus for the further development of DSCA and building an enhanced ability for reserve and active military formations in

supporting civilian response to incidents inside the United States, which would eventually lead to the formation of the DCRF. Supporting civil authorities using military forces was nothing new. The President had used federalized army forces to support civilian authority as far back as the Whiskey Rebellion in 1794 (Holt 2004, 11). Of course, Congress placed limits on the specific uses of military troops in supporting local and state administrations following the Civil War and Reconstruction period (Posse Comitatus Act, 18 U.S.C. Sec. 1835). There had also been a formal policy on the books since 1993 called *Military Support to Civil Authorities* to incorporate military forces into civil support roles for consequence management (DoD 1993), but the implementation of DSCA involved a much larger commitment of military forces from all branches to support civilian agencies in homeland defense and consequence management (DoD 2012a, B-2). The NMSCWMD was the DoD-level document that came the closest to specifying particular functions in consequence management for the military components, but it left the particular organizational framework and capacity decisions to subsequent work by military planners (DoD 2006, 14).

The National Response Framework

The National Response Framework (NRF) ties the entire consequence management response structure together. This document, developed by the FEMA NRF Center implementation team in 2008, follows the guidance instituted by President George W. Bush in Homeland Security Presidential Directive (HSPD)-5 and the development of NIMS (White House 2003a, 283). The NRF acts as the guide for all-hazards response, albeit stressing the "scalable, flexible, and adaptable" nature of the coordinating and responding elements (DHS 2008b, 1). This tenet also applies as one of the NRF's five

key principles. The NRF implementation team intended this document for government officials and emergency managers to set a standard for planning and responding to incidents of many origins and natures. The NRF includes descriptions of many of the primary stakeholders, such as the state and federal coordinating officers, in the response framework from local to federal level and provides a guideline for how the various components of the framework act in an emergency situation (DHS 2008b, 68). However, the NRF is a general framework for entities at all levels. It does not specify response actions for military responders or organizations and does not explain how military personnel integrate into an existing response structure. This is incumbent on the commanding officer in coordination with the Joint Field Office, Defense Coordinating Element and other government representatives.

The FEMA NRF Center also details specifics on coordinating for the types of incidents and emergencies that might be encountered through a series of annexes, and identifies roles and responsibilities at the local, state, tribal, and federal level. It should be noted that in general, these roles are mostly assigned to a civilian agency at some level, not to a military functionary (DHS 2008b). Within the federal role, DoD assets provide a DSCA support function, based on approval of the President and the Secretary of Defense. In accordance with the principles originally laid out in *Military Support to Civil Authorities* in 1993 (DoD 1993), DoD organizations can respond to save lives, protect property and the environment, and mitigate human suffering under serious conditions of an imminent nature (DHS 2008b, 26). The NRF also details the role of Title 32 National Guard forces versus federal Title 10 forces, and how the difference is critical to their ability to conduct certain enforcement activities. The critical piece to the NRF in its

relationship to military force support for civil authorities is that it establishes the procedures for requesting federal assistance. DoD and FEMA planners learned many of these lessons in the wake of the response to Hurricane Katrina (Dall 2011, 27). In the NRF, the FEMA resource center specifies that proactive deployment of military forces is likely to occur in the event of a CBRNE or WMD event, massive earthquake or other large scale event (DHS 2008b, 42). Regional Defense Coordinating Elements prepared for such actions in the lead up to Hurricane Sandy in 2012, and although not requiring all assets, this did shorten the time to response in those cases where such assets might have been requested (Schlafer 2013). This proactive response concept has implications for the DCRF as the Secretary of Defense can be activate and preposition the force in anticipation of a potential incident. The NRF does not specify how this is done but rather how all of the response elements are intended to integrate through a common understanding of the players and their roles.

By utilizing one or more of the fifteen Emergency Support Functions (ESFs) (see table 1) outlined in the National Response Framework annexes (DHS 2008c, 13-42), FEMA can coordinate for capabilities and resources to provide them to the local, state, or tribal incident manager (DHS 2008b, 57). Several ESFs have direct correlation to the function of the DCRF: Mass Care (No. 6), Public Health (No. 8), Search and Rescue (no. 9), Oil and Hazardous Materials Response (No. 10), Agriculture and Natural Resources (No. 11), and Energy (No. 12) all have applicability to a potential DCRF response for DCSA purposes (DHS 2008c, 6). Field Manual (FM) 3-28, Civil Support Operations, specifically lists The Oil and Hazardous Materials Response ESF in relation to Army preparedness for CBRNE response as a military capacity to assist in major national

incidents (United States Army 2012, 4-2). Although several more of these ESFs have direct correlation to the National Planning Scenarios which the author uses for analysis in this thesis, none of the ESF descriptions specify how or when to use military forces in any particular type of incident. In addition, they do not address what capability or capacity is appropriate for a particular ESF. Addressing this capacity issue by comparing scenarios incorporating the support functions to the capacities of the various military response elements is a key part of the research in this thesis.

In accordance with the ESF concept as outlined in the *Overview: ESF and Support Annexes* (DHS 2008c), when the incident commander in conjunction with the state emergency operations center activates an Emergency Support Function for CBRNE, the FEMA Joint Field Office (JFO) will coordinate with the Defense Coordinating Element present to facilitate processing the request for federal forces upon request of the Governor (DHS 2008c, 5). The DCE will in turn go through the appropriate channels to request deployment of the DCRF (or other designated force) from NORTHCOM and then forward mission assignments to DoD organizations as required (DHS 2008b, 68). DHS does not address this employment concept using the DCE as part of the NRF or ESFs, but Army planners do as a military procedure in FM 3-28 (United States Army 2012, 2-24, 4-10). The activation of the DCRF in relation to ESF number 10 as part of the National Planning Scenarios is incorporated during the thesis analysis.

FEMA also refers to the planning aspects of preparing for emergency response through the *National Preparedness Guidelines* (NPG) and the fifteen *National Planning Scenarios* (NPS) that DHS and DoD planners use to develop exercises and priorities for training response organizations. President George W. Bush directed the establishment of

the NPG in *Homeland Security Presidential Directive* (HSPD)-8, which specified that the DHS was to coordinate all-hazards response to domestic incidents (White House 2003b). The NPG in turn outlines the preparedness goals and vision for national incident response by elements at local, state, and federal echelons and for most anticipated hazard types (DHS 2007, 2). The most important component of the NPG is the capabilities-based approach contained in the guidelines. This is the first major document that outlines a specific set of capabilities that a responding element should have, such as CBRNE detection, decontamination, communications, and medical treatment, for dealing with a major event (DHS 2007, 4). FEMA lists these capabilities in terms of desired outcomes, not by type of equipment or capacity. The NPG, although it clearly defines desired response competencies, does not address how much is appropriate for a type of response or at what level such capability is appropriate.

The DHS preparedness planners listed a number of potential scenarios with national-level implications in the NPG (DHS 2007, 31). DHS published these scenarios separately as the *National Planning Scenarios* (NPS), a series of large-scale incidents intended to allow local, state and federal disaster response planners a standardized set of potential situations against which to plan and exercise capability (DHS 2006). Although the NPS provide more detailed concepts of what could potentially happen in the event of a CBRNE attack, release, or accident, they are intended for use by personnel at all levels, military and civilian. The NPS do not address the entire range of possibilities (for example, an accidental release from a nuclear power plant) nor do they account for scenarios compounded by one or more incidents simultaneously (DHS 2006, ii). However, in the NPS, FEMA does provide a basic set of planning situations that allow

for hazard response preparation and will allow for basic analysis against the CBRNE Enterprise response elements' capabilities. What capacity is appropriate for the desired capability-based outcomes and scenarios presented in the NPG and NPS will be defined in the thesis research by comparing the military response elements against three examples of the scenarios outlined by the DHS in these national preparedness documents. The NPS in general and these three scenarios are discussed in detail in the research methodology.

Prior Military Literature on the CBRNE Enterprise

The amount of literature and information on the CBRNE Enterprise is varied, depending on the level and type of the force involved. With regard to the WMD-CSTs, this force has existed since the late 1990s, and there is more information as to its history and utilization. General Craig McKinley, Chief of the National Guard Bureau, released a recent revision of *National Guard Regulation 500-3*, which specifies the roles, responsibilities, and procedures for requesting the WMD-CST of a particular state (NGB 2011). The regulation outlines the particular response timelines for the WMD-CST as the first military echelon of the CBRNE Enterprise framework, and concurs with the timeframe of notification, plus three hours as shown in the NORTHCOM CBRNE Enterprise framework briefing (Hessdoerfer 2011). The regulations for both the WMD-CST and CERFP outline the coordination between the National Guard elements responding, but these regulations only describe their relationship to "third tier" federal forces in terms of a request through the state Governor for additional federal support and in coordination with JTF-CS (NGB 2011, 16). This regulation does not address how the WMD-CST will specifically interact with federal forces or what capacity it has. The Chairman of the Joint Chiefs of Staff (CJCS) provides procedures for interaction between

the commanders of state military forces and federal forces in the event of DSCA in CJCS Instruction 3025.01 (DoD 2012a, B-4). Even though incident commanders typically request support forces from lower echelon to higher echelon in the event of a large incident, the lower echelon force's operating procedure does not specify the guidelines for such requests. This could lead to difficulties in determining the proper point at which to request higher echelon assistance, such as the DCRF.

The Director of Operations for NORTHCOM published a training aid in January 2012 called the *DSCA Handbook*, which provides Tactical Commanders and Staffs a reference guide for implementing military functions in a DSCA mission. This guide contains background on DSCA legal, doctrinal, and policy issues, examples of planning for civilian and military responses to natural disasters as well as an overview of incident management processes in accordance with NIMS (NORTHCOM 2012c, 1-1). This handbook outlines the civilian and military coordinating and planning entities that are involved in a federal support response, such as the DCE and JTF-CS, but mainly deals with natural disasters and does not discuss CBRNE-related incidents in any detail (NORTHCOM 2012c, xix). Although the guidebook provides guidelines for federal military response to disasters, it lacks definitions on the capabilities and capacities of assets like the DCRF for CBRNE response and does not specify the integration between CBRNE response elements. However, the guidebook provided an overview of the key agencies and staffs involved in interaction between state and federal levels in the event of a disaster (NORTHCOM 2012c, 3-18).

Lieutenant Colonel Christian Van Alstyne explored the value of establishing standards and practices for the HRF in a 2012 thesis, concentrating on the integration of

the HRF with civilian standards and capabilities (Van Alstyne 2012, 2). Both Van Alstyne in his thesis (Van Alstyne 2012, 36) and a fire department executive with extensive WMD planning experience (Vickery 2013) advocate a concept of ensuring the interoperability of a military force with the same set of standards as the local responders it may be supporting. MEB personnel go through a train-up and validation program much the same way as the CERFP and HRF, but through an exercise directed by the ARNORTH commander (Van Camp 2012, 24) which incorporates elements of consequence management and disaster relief (Burke 2012).

The DCRF, like its National Guard counterparts, must maintain standardized certifications for search and rescue as well (Van Camp 2012, 25). The annual rotation on and off the DCRF mission creates complications for the MEB in maintaining such certifications in all required areas (Van Camp 2012, 25). Van Alstyne discussed the need for National Guard force standardization to create interoperability with other responders, but did not address this for active forces. The DCRF, as a CBRNE Enterprise response organization shares a need for interoperability with both state and local forces as elements of the DCRF could deploy in any area during the incident. This becomes an important issue with capacity as well. The capability of the DCRF personnel to conduct activities in a manner commensurate with the forces they are supporting will affect their ability to provide adequate response support.

Several organizations have provided overviews of the CBRNE Enterprise as a whole, from the initial low-profile response of the WMD-CST to the activation of the large, active-duty DCRF and C2CRE. A presentation from Joint Task Force-Civil Support (JTF-CS 2012) includes an overview of the CBRNE Enterprise and the

capabilities of the components based on the same capabilities-based analysis from the NPG (DHS 2007). In this presentation, JTF-CS outlines the scalability of the elements based on several scenarios but does not discuss the capacity of a particular element in terms of medical or decontamination throughput (JTF-CS 2012). Colonel Heinrich Reyes of the National Guard Bureau also details the structure of the CBRNE Enterprise in his briefing on the response capabilities of the National Guard, including discussing the capabilities and characteristics of the constituent WMD-CST, CERFP and HRF (Reyes 2012). Reyes mentions the DCRF and C2CRE as potential support elements from the active component, but does not discuss their characteristics in detail nor their capacity to support a major incident. Ron Hessdoerfer of NORTHCOM presents the most comprehensive overview of the CBRNE Enterprise, and even includes the response timelines and decontamination capacities of the CERFP, HRF, and DCRF (Hessdoerfer 2011). Hessdoerfer's presentation is the most inclusive in terms of organizational structure, capabilities, and response timelines. However, it does not address medical treatment capacity or the ability of higher echelon elements to command and control a specific number of other lower elements. The DCRF is included in Hessdoerfer's presentation as a "joint army/air/marine" organization (Hessdoerfer 2011). Hessdoerfer does not detail where these forces come from or specify they are located in multiple locations throughout the country (JTF-CS 2012). These presentations on the overall structure and capabilities provide a solid overview of the structure of the CBRNE Enterprise and some of the capabilities of the elements, but they each lack definition as to the capacity of the elements to mitigate situations based on a recognized standard.

Prior Research Methodologies and Analysis

Studies on the efficacy of the CBRNE Enterprise have tended to originate from academic research by military personnel in various graduate-level schools over the past five years, as the CBRNE Enterprise framework is still relatively new. In an earlier study, Major Kevin Colyer discussed the potential command and control framework for combating WMD within a Commander-in-Chief's (now a geographic combatant commander) area of responsibility (Colyer 2001). Colyer concentrated on developing a framework for coordinating military integration into WMD crisis response abroad or in the homeland before the advent of the CBRNE Enterprise. Colyer defined the problem as an abundance of agencies that would be involved in response exercises without a clear coordinating hierarchy (Colyer 2001, 60). Complicating this training effort was the lack of a clear request system for local authorities to obtain federal assistance (DoD 1997, 5).

Through a methodology utilizing the WMD counterterrorism response programs of federal agencies to include the Departments of State, Defense, Justice, Energy, Health and Human Services, the Central Intelligence Agency and FEMA (at the time not under DHS), Colyer compared these programs against the foreign consequence management, foreign counterterrorism, and U.S. counterdrug models for response integration. He determined that the models for foreign operations did not have application to domestic operations, as federal forces could only be used to support local and state authorities if the lower echelon responders did not have a capability that the federal government did (Colyer 2001, 95). However, the framework that JTF-CS followed at that time under Joint Forces Command did allow for support to civil authorities in planning and preparing for domestic emergencies, but the regional Commanders-in-Chief lacked the

same assets to conduct contingency planning for counter-WMD efforts (Colyer 2001, 97).

In 2001, only the CBIRF, WMD-CST and TEU had military personnel and equipment to handle consequence management functions for domestic response. Joint Chiefs Chairman General Hugh Shelton used CJCS Instruction 3214.01: *Military Support to Foreign Consequence Management Operations* (1998) to instruct the TEU to conduct chemical and biological consequence management (Colyer 2001, 99). A larger force at the federal military level did not exist to respond to a major CBRNE incident in the homeland. Colyer advocated for adopting a Joint Interagency Task Force structure as was used in domestic counterdrug operations to command and control consequence management forces. When JTF-CS became a standing headquarters under NORTHCOM in October 2002, it took over many of the same functions as a Joint Interagency Task Force in controlling domestic DSCA operations for WMD (Gray 2012, 4). Colyer's assertion that the JTF-CS capability to plan for and control consequence management functions was critical for a regional combatant commander became realized under NORTHCOM.

Discussing the imbalance of consequence management capabilities between active and reserve components, Colonel Anthony Skinner wrote a 2008 thesis highlighting the role of the U.S. Army Chemical Corps in combating WMD (Skinner 2008). Skinner made a distinction between the concept of a WMD event and a CBRNE event, noting that the term WMD is misleading as it is both overused politically and not well defined in terms of actual levels of destruction (Skinner 2012, 5). Policy analyst Albert Mauroni also highlighted this point, arguing that the various definitions of

combating WMD had led to confusion over what agency or force had responsibility for what function (Mauroni 2010, 62). Mauroni further advocated disassociating the term "terrorism" from WMD, and treating them separately (Mauroni 2012, 68). Skinner went on to discuss the priorities for a strategy to combat WMD, arguing that the best place the Chemical Corps can make a difference is in consequence management, but that there is a lack of emphasis being placed on CBRNE defense training and preparation (Skinner 2008, 9). He noted the lack of realistic CBRNE scenario training in simulations at the joint level, and the absence of regular training is leading to a diminishing set of perishable skills (Skinner 2008, 11).

As the federal level CBRNE consequence management force at the time of Skinner's thesis was the CCMRF (Vlahos 2012), he argued that the CCMRF had an unrealistic timeline of one year non-deployable implementation as the federal CM force, followed by another six months to a year to train and certify for another deployment cycle (Skinner 2008, 15). The same cycle of year-on, year-off rotations to reset and train still holds true for the MEB as the core of the DCRF, the successor to the CCMRF (Van Camp 2012, 25). Skinner also advocated for enhancing active chemical formations with the same types of consequence management and search and rescue training that the National Guard CERFP (and HRF) receives in order to increase their capability to support consequence management at home and abroad as there may be a need for follow-on forces in the event of a major CBRNE incident (Skinner 2008, 18).

In his essay, Mauroni also argued to direct defense planning toward restoring essential services over "saving lives," which he said was better left to state and local responders (Mauroni 2010, 67). This is short sighted, as Mauroni sees the deployment of

personnel in the seventy-two to ninety-six hour window as optimal for recovery operations (Mauroni 2010, 67), rather than the need for rapid deployment of personnel to support local and state providers if their assets are overwhelmed by a scenario involving thousands of potential victims (DHS 2006).

In 2010, analyst Christine LeJeune wrote an article about the direction that consequence management force planning was going, emphasizing the evolving nature of the CBRNE Enterprise framework (LeJeune 2010). Some of the challenges she presented involved the leadership of forces at the state and federal level in the event of an incident requiring both levels to respond. The NORTHCOM Commander has prescribed that the dual-status commander is the solution, as this officer can simultaneously command both echelons (NORTHCOM 2012b). As previously mentioned, this can only happen in one state at a time. She advocates the possibility of federalizing state forces such as the HRF under NORTHCOM authority (LeJeune 2010, 5). However, this takes away their state status and ability to act in a law enforcement role (Posse Comitatus Act, 18 U.S.C. Sec. 1385). However, LeJeune does point out that President Barack Obama appointed a Council of Governors at the time to investigate the role and legality of implementing a dual-status commander (LeJeune 2010, 7), a system which Congress and DoD has since codified (NORTHCOM 2012b).

Another complication LeJeune notes is the question of how funding affects authority. The DoD solves this in part by federal funding of National Guard units under Title 32 United States Code, and in part by facilitating synchronization between the state and federal coordinating elements once a Joint Field Office is established. As the CCMRF was the federal military consequence management force available (Vlahos 2012) when LeJeune wrote her article, she discussed the issues surrounding the

implementation of the CCMRF reduction to DCRF in her article. LeJeune mentioned that in the wake of Hurricane Katrina, there was concern about the state-level HRF's ability to respond effectively to national level emergencies, thus necessitating the creation of three CCMRFs (LeJeune 2010, 6). When Secretary of Defense Gates reduced this force to one active CCMRF (later the DCRF), former Assistant Secretary of Defense for Homeland Defense Paul McHale raised concerns that "a single-CCMRF plan would place national security at greater risk" (Castelli 2010). LeJeune noted that whether the reduction of three CCMRFs to one federal DCRF and several much smaller state HRFs will be adequate may not be realized until they are tested in a catastrophic event (LeJeune 2010, 6).

Major Nicholas Dall published his 2011 thesis on the overall framework of the CBRNE Enterprise and its effectiveness based on the organizations put in place after September 11, 2001 (Dall 2011). As there had not been a major domestic CBRNE incident by which to test the effectiveness of the CBRNE Enterprise elements, Dall proposed to compare the response elements against a set of real-world case studies. Dall also noted how the three-CCMRF structure was reducing to a single brigade sized DCRF element, referring to BG Johnathan Treacy's comment that the change to a DCRF increased the size of the element to around 5200, with 800 to 1000 personnel primarily in the area of life-saving (Dall 2011, 16). This comment is a misnomer, as the three CCMRFs combined carried nearly 15,000 personnel (from active and reserve component forces) (Vlahos 2012) and the reserve component element was dropped in favor of FEMA-region oriented HRFs in the National Guard carrying 560 personnel each (LeJeune 2010, 4). As Dall pointed out, the strength of DoD response to a major incident is in the numbers of personnel the NORTHCOM Commander can provide.

Using a case study methodology, Dall applied the evaluation criteria of preparedness, response, and a comparison of incidents to CBRNE Enterprise response elements to determine their effectiveness (Dall 2011, 36). The incidents he used to measure the effectiveness of the response are the 2001 Senate building anthrax letters incident, the Tokyo Subway Sarin gas attack, and the Chernobyl nuclear reactor accident (Dall 2011, 40-45). The first incident at the Capitol is comparatively small, contaminating a building; the second is medium, contaminating several blocks and underground structures; and the third is large, contaminating over 5000 square kilometers (Dall 2011, 44). Dall concluded that the model for military DSCA response to large incidents such as the reactor accident (and larger than the relatively small gas attack) is an acceptable and feasible response by doctrine, but that is does not meet the criteria for completeness (Dall 2011, 60). He remarked that the CBIRF as a standing, co-located force demonstrated enhanced effectiveness in the anthrax contamination case study, and recommended that the Army adopt a similar model for a permanent organization with the DCRF mission (Dall 2011, 69).

In 2012, Colonel Kent Soebbing published a thesis on force structure considerations for DSCA (Soebbing 2008). In this thesis, Soebbing discussed the placement of military support to civil agencies under the guidelines of the DHS, although federal forces would remain under the command of federal military leadership. He explained the function of the National Response Framework in outlining the roles and responsibilities for the coordinating elements at all levels, and the use of a dual-status commander to command both state and federal forces simultaneously (Soebbing 2012, 14). Despite the usefulness of the dual-status commander concept, an important

distinction that Soebbing made was the limitation that this commander could only command forces in one state (NORTHCOM 2012b) and the potentially ad-hoc nature of federal response if elements would have to be used in multiple locations (Soebbing 2012, 14). Soebbing noted that the small size of the WMD-CST, although highly technical, provided limited capability and that the CERFP and HRF were most capable of supporting small-scale contingencies managed by state authorities (Soebbing 2012, 17). He also highlighted the need for the DCRF to be brought together from several locations, and that the lift assets alone for the DCRF as it was designated in 2012 would come from Washington, Kentucky, Florida, Colorado, and Virginia (Soebbing 2012, 16.) Understanding that the National Guard carries the primary responsibility for homeland support, Soebbing recommended that active component formations and supporting reserve formations be regionally co-located to enhance deploy ability and training preparation, and that a federal headquarters take the lead in directing federal forces response to a major incident (Soebbing 2012, 21).

Colonel Bret Van Camp's 2012 thesis work on the CBRNE Enterprise is the most recent research work available on the CBRNE response components and their relationships. Van Camp surmised that DoD did not build in specific force structure for DSCA response, but rather utilized existing units to meet the needs of DSCA response through force generation (Van Camp 2012, 18). Van Camp noted that although there were adequate laws and plenty of guidance regarding DoD response in support of DSCA, it was still considered a "pick-up" game, without a standard structure to maintain civil support operations (Van Camp 2012, 18). Skinner reflected the same concern four years earlier (Skinner 2008, 15).

Van Camp concentrated on the structure of the MEB, the core element of the DCRF. His analysis determined that the MEB was well-suited to the DCRF mission as it held a robust, multi-functional staff that could act as the operations component of a DSCA task force (Van Camp 2012, 20). Van Camp also stated that the MEB had yet to deploy except for training events, and that its capability on paper was adequate, but that it had not been put to a practical test. He advocated the training and use of the MEB and DCRF in missions beyond the CBRNE environment including natural disasters and humanitarian assistance (Van Camp 2012, 26), a recommendation also presented by Soebbing (Soebbing 2012, 17). In addition, Van Camp recommended the retention of subordinate formations organically to allow for training, unit cohesion, and to lower costs (Van Camp 2012, 26). Although fiscally difficult, he postulated that creating more active-component MEBs might allow for lower overall operation tempo and the availability of MEBs for crisis action or theater security cooperation (Van Camp 2012, 28).

There is very limited research and literature available on the experiences, utilization of, and lessons learned from the DCRF as it was implemented only two years ago (Vlahos 2012). Major Joseph Gray explored the utility of JTF-CS in commanding and controlling the DCRF in his 2012 thesis (Gray 2012). Gray based his analysis on case studies and utilized the doctrine, operations, training, material, leadership, personnel, and facilities evaluation process as outlined in the Joint Capabilities Integration Development System (DoD 2012b). Gray's demonstrated that JTF-CS was capable of conducting C2 of DCRF forces as organized, but he also determined that an Army light infantry division headquarters battalion under the same evaluation process could also command and control the same element. However, such an organization would not have the same

experience level in consequence management as JTF-CS (Gray 2012, 76). Gray recommended the assignment of a back-up headquarters other than JTF-CS for C2 of the DCRF or other federal military response in case it was located in proximity to the incident or if there were multiple incidents simultaneously (Gray 2012, 77).

The DCRF, as the active-duty military's primary consequence management force, has a requirement to be able to respond rapidly and support any large-scale scenario involving CBRNE material and possibly in a non-CBRNE DSCA role. Although there are several examples of research on the CBRNE Enterprise as a whole (Dall 2011; Gray 2012; Van Camp 2012) or on the National Guard aspects of the CBRNE response framework (Van Alstyne 2011), there is no specific analysis completed on the capacity and adequacy of the DCRF as a new part of the CBRNE Enterprise. As the largest standing military force for CBRNE DSCA response, the DCRF has to be able to respond quickly and the NORTHCOM Commander should have confidence in the DCRF accomplishing its assigned mission. However, without a prior major real-world incident to test the effectiveness of the DCRF, and only limited exercise scenarios such as Vibrant Response (Burke 2012) to integrate the DCRF with other response organizations, the NORTHCOM Commander has only limited data by which to measure the capacity of the DCRF in supporting a large-scale CBRNE event.

Conclusion

The available literature includes examples of baseline documents that helped to define the way forward in establishing a national framework for incident response and establishing standards for organizational interaction. In some cases, the literature has not caught up with the evolving military structure. Likewise, prior research has concentrated

on defining the force structure and command relationships between elements of the military CBRNE Enterprise, but not on determining the capacity of the elements to respond to standardized scenarios. The CBRNE response elements discussed here are consistently evolving and some, like the WMD-CSTs and CBIRF, have had more practical experience and time to develop into a recognized, capable force than others like the DCRF. As a result, not every unit has had the opportunity to train on the myriad of possible contingencies it might be required to respond to. Three critical factors play into the ability of these forces to prepare for any CBRNE eventuality: time, training opportunities, and fiscal considerations. Although time and training opportunities are in constant flux based on competing military requirements, especially with the rotation of units in and out of the DCRF mission (Van Camp 2012, 25), fiscal considerations often drive the process of getting units together for collaborative training. Developing realistic training opportunities like Vibrant Response and others are an important step in ensuring force readiness and build upon realistic, standardized planning scenarios like the NPS (DHS 2006). The DCRF will be discussed in more detail against the scenarios in order to determine its effectiveness as organized and resourced and whether further study is warranted.

CHAPTER 3

RESEARCH METHODOLGY

Introduction

The research methodology used in this thesis is a comparative analysis of the CBRNE Enterprise response organizations against a series of scenarios developed by FEMA as part of the National Preparedness Guidelines (DHS 2008b). The author has included oral history interviews from personnel with expertise in the subject matter to better develop an understanding of the relationships between different elements of the CBRNE Enterprise and non-military responders. The material to comprise this methodology is already a matter of record, so there is no requirement to generate or collect data from a quantitative analysis. A drawback to this methodology is that the availability of information that currently exists that limits the data that can be used for the thesis as a major CBRNE incident requiring the activation of the DCRF and JTF-CS has not occurred that would provide real-world feedback for analysis. However, based on the capabilities of the various response elements and the established standardized scenarios provided, an analysis of the effectiveness and capacity of the potential responding organizations is possible.

Comparison and Analysis Method

The first part of the methodology involves collecting prior research information on CBRNE missions and organizations inherent to the CBRNE Enterprise and the Army. The implementation of DoD's CBRNE framework is an ongoing process, requiring periodic revisions reflective of the current threat picture and fiscal situation. It is

important to define what the CBRNE force structure developed from, where it currently stands, and what changes or developments to expect based on current guidance from the national command and defense authorities.

The second part of the methodology involves comparing the various CBRNE Enterprise response elements, their organizations, requirements, strengths, and weaknesses against the published, nationally accepted scenarios contained within the NPG. This will concentrate primarily on the DCRF as the largest ultimate consequence management (CM) force. The analysis includes personnel and equipment requirements, organizing principles, and command structures. It also incorporates the methods by which the response elements are activated or implemented, their capabilities once activated, limitations based on manning, and reporting and termination criteria. A comparative analysis allows for a complete picture of the role that the DCRF plays in overall DoD CBRNE operations and identifies the gaps or overlaps that exist where review or revision of the DCRF structure or CBRNE Enterprise would be beneficial.

This methodology follows a structure of building response from smaller to larger elements in the event of a major incident. The goal is a thorough look at factors that comprise the CBRNE response by military forces at the state and federal level and a process to measure their effectiveness and applicability to the possible scenarios. Following this, an analysis develops with which to create possible insight into alternative methods for implementing the force structure, reducing redundancy and waste, and building cooperative training strategies for the CBRNE forces.

The History of CBRNE Enterprise Missions

Most of the current forces aligned under the CBRNE Enterprise model have limited real-world mission experience. However, in the case of the CBIRF and some of the WMD-CSTs, there were several instances where they were instrumental in responding to and assessing a potential or real CBRNE threat, such as in the 2001 Senate building anthrax letter attacks (CBIRF 2013). In this case, a state JFHQ activated a WMD-CST to look at a suspicious substance that came through the mail or a powder that leaked from a package, which turned out to be positive for anthrax bacteria (Dall 2011, 51). However, most of these missions eventually turn out to yield no threat. Nonetheless, it is important that the public and governmental officials know that there is a ready force available twenty-four hours a day to provide initial response and presumptive confirmation or denial of a potential CBRNE hazard. The CBIRF and WMD-CSTs also support major events in a forward-deployed role, such as major political events like the Republican and Democratic National Conventions and Presidential Inaugurations, and visits from high-ranking dignitaries such as the G-20 Summit (CBIRF 2013). Both the CBIRF and WMD-CSTs maintain readiness to respond to suspicious materials incidents, provide advice and training to other responders, and exercise for their mission set.

The Posse Comitatus Act and regulations like DoD Directive 3025.18 limit the CBIRF, an active duty force, to generally providing assistance in a by-request support role like the DCRF. However, the CBIRF has more history of dealing with CBRNE-related missions due to its longevity within the Armed Forces (CBIRF 2013). Utilizing this organization in a forward-deployed role at inaugurations and special events has significantly decreased response times to any potential issues, but has also placed the unit

in close proximity to a potential event. The CBIRF, comprised of two 200-man Incident Response Forces, can handle two smaller-scale incidents or deployments simultaneously and has operated in that capacity since late 2004 (Hill et al. 2004). In 2011, the CBIRF supported efforts following the earthquake in Japan as part of Operation Tomodachi in coordination with JTF-CS (Marine Corps Gazette 2013). Thus far, these are the prime examples of when a real-world scenario has necessitated the use of a federal CBRNE force–namely, because the incident affected federal property, events, or international partners. Both the WMD-CST and CBIRF have the advantage of being full-time, dedicated forces: one at the state level, and the other at the federal level, but they both have size and capacity limitations.

Each state JFHQ trains and evaluates CERFPs for the consequence management mission, but the state commander can call upon them for other support missions. By their nature of being a force that trains together and is on call from around their state, they also have the capability to act as a civil support force separate from CBRNE events. Last year, the West Virginia JFHQ activated their CERFP to evaluate the structural integrity of buildings in the wake of Hurricane Sandy based on their training and expertise in search, rescue, and technical extraction (Selby 2012). Having that capability inherent within a state provides utility both in CBRNE response and in other civil support functions. There are few, if any, examples of a state JFHQ activating a CERFP for a CBRNE incident response in the past eight years, but other functions in collapse rescue and support of public functions may require the use of the CERFP. Maintaining the readiness to respond in the event of a CBRNE event for the CERFP is imperative as such an incident is likely to come with little notice. Likewise, the states with a HRF can use that capability in a

similar way to the CERFP, providing other civil support functionality while maintaining CBRNE readiness. State JFHQs continue to exercise their CERFPs and HRFs through periodic regional exercises called Vigilant Guard, which exercise local responders, the state emergency management apparatus, the use of EMAC, the WMD-CST, and the CERFP or HRF from several states in a single, multi-day event, sponsored by NORTHCOM with cooperation from DHS and FEMA (NGB 2007).

The DCRF is now in its second MEB rotation, with the mission assigned to the 1st MEB at Fort Polk, Louisiana. In the same way a deploying unit conducts a train-up and evaluation such as a mission rehearsal exercise, the MEB assuming the DCRF mission also conducts a train-up and certification exercise. This rehearsal exercise, organized through NORTHCOM and ARNORTH, is called Vibrant Response and takes place annually (Van Camp 2012, 24). Vibrant Response validates the operability and coordination for units assigned to the active-duty homeland defense mission, including the DCRF and augmenting units (Camp Atterbury 2013). This is done in coordination with some National Guard elements to simulate the integration, support, and hand-off of DSCA related functions as part of a joint response scenario. Despite the primary function of the DCRF in responding to a CBRNE event, the unit also has capabilities that are useful in natural disasters and other DSCA requests. Although not a CBRNE mission, elements of the DCRF began preparations for deployment in 2012 in support of Hurricane Sandy. However, the state level responders did not end up needing DCRF support (Brown 2013).

All of the components of the CBRNE Enterprise (excluding the CBIRF, which is a separate, but associated element), have a functional consequence management mission

and a requirement such as hazard identification, decontamination, rescue, medical support, or command and control as part of the framework (Hessdoerfer 2011). However, all of the elements have utility outside of just CBRNE response, despite that being their primary purpose. The search and rescue, medical, and extraction functions of the various organizations have utility in the event of a natural disaster as well. The recent history of the CBRNE Enterprise components is important in understanding their value, but a comparison of the elements will help in the analysis of their capabilities, requirements, strengths, and weaknesses.

Comparison of the CBRNE Enterprise Elements

Even though they are not a normal part of the CBRNE Enterprise framework, the CBIRF and active-duty TEU CBRNE Response Team (CRT) will be included as potential response elements as they are also active-duty CBRNE response forces available to the President or Secretary of Defense if required. In ascending order of personnel size, the CRT will be the smallest element considered and the DCRF will be the largest. Table 1 shows the comparisons by unit type, stated capabilities, support requirements, strengths, and weaknesses.

Table 1. Comparison of CBRNE response elements

Unit	Component	Personnel Strength	Stated Capabilities	Decontamination Capability	Medical Capability	Non-CBRNE DSCA Capabilities	Timeframe to Deploy	Location of Assets	Support Requirements	Strengths	Weaknesses
CRT (TEU)	Active Army	15 PAX	Identification, analysis, advice, remediation, EOD, some decon, confined space	Self + 40 PAX	None	Confined Space, Rescue	H+24 hrs on PTDO	Co-located	Staging base, security element when employed	CONUS/OCONUS capable, light, quick information turn-around, co-located assets, easily disengaged, can remediate WMD	Small size, limited external decon, no internal medical, dependent on technology, may require federal authorization
WMD-CST	NG	22 PAX	Identification, Analysis, Advice	Self Only	Self Only	None Stated	H+3 hrs	Co-located	Self-supporting for short periods	Rapid Deploying, all assets co-located, quick information turn-around, light, mobile, easily disengaged	Small size, no external decon or medical capability, dependent on technology, usually state-specific
CERFP	NG	180+ PAX	Decon, Search and Rescue, limited C2, medical triage	450 PAX in 12 hours	triage, level I care	search and rescue, collapse extraction, confined space, medical support	H+6-12 hrs	spread throughout a state	Relief personnel for extended decon, food/billeting for long deployments, may require security or logistical support	moderate size, fairly rapid deployment, versatile force, DCSA and CBRNE capable	requires external security element, longer disengagement, moderate footprint, requires mustering from across state
CBIRF	Active Marine	200-250 PAX per IRT	some analysis, decon, search and rescue, confined space, limited medical capability	150-200 PAX per hour, 1800 in 12 hours	self and triage, limited	search and rescue, confined space	H+12 hours (assessment team), H+24 hours (main body)	Co-located	food/billeting for long deployments	CONUS/OCONUS capable, mobile, co-located assets, fairly rapid deployment, DSCA capable, two team capability, internal security element	moderate footprint, requires federal authorization
HRF	NG	560+ PAX	Decon, Search and Rescue, robust C2, medical triage, security element	450 PAX in 12 hours	triage, level I care	search and rescue, collapse extraction, confined space, medical support	H+6-12 hours	spread throughout a state	Relief personnel for extended decon, food/billeting for long deployments, may require additional logistical support	large size, fairly rapid deployment, versatile force, provides homeland defense/security, DSCA and CBRNE capable, can C2 multiple smaller T32 forces	large footprint, longer disengagement, requires mustering from across state
C2CRE	Active Joint	1500 PAX	Decon, CBRNE assessment, Search and Rescue, robust C2, level II medical, engineering, logistics, security, transportation, ground EVAC	Augments DCRF, increase by 20-30%	level II care	search and rescue, confined space, medical support	H+96 hours	spread throughout the US	food/billeting for long deployments, may require contracting and additional logistical support	large size, versatile force, provides own security, DSCA and CBRNE capable, can C2 multiple smaller T10 forces	large footprint, longer disengagement, requires mustering from across nation, requires federal authorization, slower deployment
DCRF	Active Army	5200 PAX (two phases)	Decon, CBRNE assessment, Search and Rescue, robust C2, level III medical/surgical, engineering, logistics, security, transportation, ground EVAC, air lift and MEDEVAC	2700 PAX in 12 hours	Level III care, surgical	search and rescue, confined space, medical support	Phase I (2000) H+24 hours Phase II (3200) H+48 hours	Spread throughout the US (core MEB co-located)	food/billeting for long deployments, may require contracting and additional logistical support	large size, versatile force, provides own security, DSCA and CBRNE capable, moderate deployment timeline for large force, can C2 multiple smaller T10 forces	large footprint, longer disengagement, requires mustering from across nation, requires federal authorization

Source: Created by author, data obtained from Ron Hessdoerfer, "CBRN Response Enterprise" (Slide Presentation, United States Northern Command N/NC-J71, 2011).

General observations indicate that the larger the force, the more capable it is. However, the larger the force, the longer that force needs to deploy forward and later redeploy to home station. The forces that have dedicated, full time personnel (the CRT, WMD-CST, CBIRF, and DCRF) are all capable of deploying some element quickly (within 24 hours), with follow-on forces coming shortly thereafter. The National Guard elements are also able to deploy fairly rapidly for their size, but in the case of the CERFP

and HRF, they may have to pull personnel together potentially from across the state. The C2CRE force has the relative weaknesses, based on its extended deployment timeline and large size (despite it bringing considerable capability). The CBIRF has the relative strengths, as it combines a full-time, co-located force with versatile assets and a modicum of self-sustainment for a limited period of time, as well as its own force protection.

The National Planning Scenarios

FEMA publishes the National Planning Scenarios (NPS) as an addendum to the NPG. The NPS consists of the scenarios themselves, the scenario attack timelines, and adversary group profiles (a set of fictitious groups carrying out the attacks in the various scenarios) (DHS 2006). The FEMA Scenario Working Group finalized the NPS in March 2006, containing fifteen scenarios that would require a significant response by local, state, and federal authorities. The working group designed the scenarios for use at any level to help guide capabilities-based planning and eventually to help mould exercises and evaluations to determine effective integration of response assets at multiple levels. The fifteen scenarios include: a nuclear detonation, attacks with biological, blister, nerve, and radiological agents, an influenza pandemic, an toxic industrial chemical release, a chlorine tank explosion, a major earthquake or hurricane, the use of improvised explosive devices, intentional food contamination, a foreign animal disease infection, and a cyber attack (DHS 2006). This methodology focuses on CBRNE response factors and will forego the non-CBRNE scenarios, although there is definite DSCA applicability to the elements under consideration in almost all of these cases. Here we will consider the CBRNE forces against National Planning Scenario 1, detonation of a 10 kiloton nuclear device, Scenario 2, release of aerosolized anthrax, and Scenario 14, spread of foreign

animal disease. The author drew the following scenario information from the NPS (DHS 2006).

Scenario 1: Nuclear Detonation–10-kiloton
Improvised Nuclear Device

Scenario 1 is an attack facilitated by a militant Islamist group that has stolen highly enriched uranium from a facility in the Middle East. The group smuggled the components into the United States and assembled them into an improvised nuclear device near a major city. The terrorists will use a delivery van to move the assembled device to a business district and detonate it. The NPS working group's scenario assumptions give the following results:

1. The detonation produces a nuclear yield of 10 kilotons
2. The prompt effects were over a circular area of devastation; the effect tapers off with distance
3. The device was detonated at zero elevation
4. The assumption is that few people were able to be evacuated or sheltered near ground zero for 96 hours
5. The weather is generally clear
6. Casualties are calculated without regard to incipient secondary effects like fires or collapse
7. Electricity and communications are heavily disrupted across much of the affected area

In this case, the event would likely be considered a catastrophic incident and receive an immediate declaration from the Governor, if not the President (Burke 2012).

The scenario calculates that approximately 31,000 casualties would occur just due to the blast effect, including nearly 15,000 fatalities. Using Washington, DC as ground zero, the radiation exposure from prompt neutrons and ground shine would produce 190,000 fatalities and nearly 265,000 total casualties (DHS 2006, scenario 1, appendix 1-A). This could immediately outstrip the capacity of any local responders, possibly affected by the blast as well. The WMD-CST would essentially enter into the role of radiation survey team and based on their capabilities, they would be providing readings and advice on dealing with fallout. A CERFP in this case could lose some members due to the incident itself since they might very well live in the area, and the remainder may have psychological effects from the attack. In her essay "The Psychological Effects of Terrorist Attacks," Judith Mathewson discussed that following the 1995 Tokyo Subway Sarin gas attack, over 9000 people presented in emergency rooms with psychological complaints compared to 900 with physical injuries and twelve fatalities (Mathewson 2004, 191). This complication could necessitate the activation of an EMAC for additional forces from adjoining states (EMAC 2013). The adjoining CERFPs or HRF could also be overwhelmed due to the massive structural damage, the need to avoid excessive radiation exposure, and the vast numbers of contaminated patients they would receive. Activation of the CBIRF and DCRF with Presidential or Secretary of Defense consent could possibly happen within hours. However, at the deployment rate of twenty-four to forty-eight hours from notification, contamination would have spread significantly downwind by the time a substantial force arrived.

Although the CBIRF would be close to a Washington, DC event from their base at Indianhead, MD (CBIRF 2013), they do not have the capacity address a quarter of a

million probable injured (DHS 2006). The DCRF would likely also have to request additional follow-on forces. JTF-CS would have to command and control this massive response effort in coordination with a dual status commander, who would act as the overall commander for military response in each state jurisdiction (NORTHCOM 2012b). That equates to a two-star general officer in support role to a one-star general officer. An event of this magnitude would require rapid assessment of the ground situation, a coordinated effort to sector off areas of the affected are and downwind hazard area for fallout, and emplacement of both CBRNE response elements and security elements in strategic locations to ensure decontamination and treatment of the affected populace. The incident commander cannot discount the effects to the responders either. Assets that are critical early in the response to this type of event are dissymmetry and radiation survey.

The DCRF brings an Air Force Radiological Assessment Team (AFRAT) to the fight, enabling them to monitor dose rates and compliance with occupational exposure guidance from the command (Van Camp 2012, 21). Although the CBIRF has experience with radiological survey and measurement, they have no dedicated radiological management element. The AFRAT would take the lead on collecting dose information. Essentially, under Scenario 1, all available forces would be required and even the DCRF, plus C2CRE response may prove inadequate as they would not have the capacity to manage that many wounded. The additional time it would take to bring together all of the DCRF forces from disparate locations would result in insufficient capacity to deal with the numbers of casualties the force would encounter after twenty-four to forty-eight hours.

Scenario 2: Biological Attack–Aerosol Anthrax

Scenario 2 involves the dissemination of approximately 100 liters of weaponized anthrax via a concealed spray dissemination device attached to a flatbed truck during rush hour in a large city (DHS 2006, scenario 2). Intended to produce victims with pulmonary or inhalational anthrax, the spray device emits a fine aerosol discharge over a one kilometer linear area along a busy highway, crossing the border between states (assuming one discharge with no reload). Three days later, local residents start showing up in large numbers at hospitals and doctor's offices complaining of fever and difficulty breathing. The NPS working group's scenario assumptions are as follows:

1. The first cases would present approximately 36 hours post-exposure
2. Incubation periods could vary significantly, up to 10 days for some people
3. Hospital capacity could surge to possibly 3,000 beds
4. The symptoms of anthrax could initially mimic those of influenza during a period of high flu occurrence, complicating diagnosis and treatment
5. The anthrax infection will not spread between individuals due to infection, but could be carried on fomites (transport media like clothing) to infect others
6. The untreated case fatality rate is 99 percent
7. The efficiency of the dissemination is 1 percent

This scenario is more insidious because the nature of the incident may remain hidden for quite some time before CBRNE responders are involved in any significant number. As for fatalities, the scenario calculates approximately 13,000 fatalities or injuries requiring hospitalization (DHS 2006, scenario 2). The major problem here, other than the slow progression of the disease, is the potential for panic and displaced persons

following confirmation of a biological attack. The WMD-CST would likely be the first group to identify *Bacillus anthracis* presumptively as the culprit should local responders request the team before hospital lab results confirm anthrax infection. As soon as confirmed, the incident commander or WMD-CST would request CERFP or HRF for support. As there is not inherent structural damage, the mission of these elements would be primarily medical and decontamination support. Following a gubernatorial request by either or both involved states or a unilateral Presidential declaration, of which this may very well meet the threshold, the State Coordinating Officer would likely request the DCRF for additional decontamination and medical support. Dealing with fear, panic, and displaced persons is an entirely different matter, as that will complicate the ability of the responders to sort out those actually contaminated from those who may only think they are. Clearing the contaminated area will require the transportation assets of the DCRF to move displaced persons out of the affected areas and substantial medical assets to conduct patient care and dispensing of prophylactic drug treatment. In this case, the CBIRF would also be useful in decontamination and triage (Broyles 2009), and could help with testing of samples for contamination. This is a better example of where the tiered response of WMD-CST to CERFP/HRF to DCRF is useful but this response would take additional time due to the incubation period of the initial infection (CDC 2013). Even with DCRF assets in place, the requirement to decontaminate thousands of actual infected and potentially thousands more who suspect contamination will quickly overburden the local, state, and federal response forces in this scenario. This holds especially true if the response also requires decontamination of buildings and public spaces that could return to economic viability if properly cleaned.

Scenario 14: Biological Attack–Foreign Animal Disease (Foot-and-Mouth Disease)

Scenario 14 involves the infection of a number of livestock locations with Foot-and-Mouth Disease (FMD) by an unspecified extremist group to cause massive economic and agricultural disruption. FMD is highly contagious amongst livestock and is invariably responsible for the death of the livestock either directly or due to the need to destroy the herd to prevent transmission. In this case, several members of a radical group infected animals over a three-day period in several livestock concentration areas. Five days later, ranchers start suspecting sickness in their cattle, and a veterinarian suspects a viral infection. The animal health officials send a foreign animal disease specialist out to investigate and he determines it is highly likely to be a foreign animal disease. The health official sends samples to the U.S. Department of Agriculture's Plum Island Animal Disease Center for confirmation. The next day, another veterinarian suspects the same thing at a different farm. In another state, a slaughterhouse receives animals in poor condition from the origin of the first suspected infection (DHS 2006, scenario 14). The NPS working group made the following assumptions for this scenario:

1. The disease agents were distributed in several locations in several states simultaneously
2. There is no prior warning or indication of the attack
3. Distribution of the disease will be widespread due to transport of livestock
4. Vaccination of affected livestock will not be implemented
5. Human infection is not plausible and not a factor

Although the scenario does not give anticipated numbers of affected livestock, it is a disease that will spread rapidly and almost always necessitates the destruction of

most affected animals to prevent spread (WA DOH 2002). Even if the disease only affected several thousand livestock, the economic impact due to disruptions and distrust of safe transport networks would be economically devastating. The effect of the FMD outbreak in Britain in 2001 from a single source point was an economic cost of over $13 billion (DEFRA 2002). In this case, the WMD-CST has no equipment or capability to assess and identify livestock disease agents, so there would be little utility for that element. The CERFP or HRF would be useful in two different roles: to decontaminate persons and equipment that may have come into contact with infected livestock, as they can serve as fomites to spread disease vectors, and to provide non-CBRNE DSCA assistance to agricultural authorities in culling herds, destroying carcasses, and controlling movement to prevent spread. Military medical personnel could help inoculate unaffected herds with proper training. A large pandemic of FMD might garner a rapid federal disaster declaration, primarily to get funding to states for relief and recovery. The incorporation of the CBIRF, DCRF, or C2CRE would be likely if there were indications that the disease was spreading uncontrollably, requiring a major quarantine response or extreme assistance in destroying affected livestock. By approval of the Secretary of Defense, federal forces can support state quarantine or isolation procedures through logistical, medical, transportation, communications and disaster assistance means (United States Army 2012, 4-18). In this case, the key is to get to the infection sites quickly, and use state assets available as soon as possible to stop the infection spread by supporting agricultural and health personnel in identifying ill animals, destroying affected livestock, and potentially decontaminating carriers to avoid spread.

If the infection takes considerable time to surface, it could spread to hundreds of farms in a few days or weeks, and that would require a much larger response in terms of personnel and equipment. In this scenario, the issue of capability in terms of DCRF or federal response is not a matter of capacity, but rather training and experience with an agricultural disease vector.

The next chapter incorporates analysis of these scenarios, but all three present very different possibilities for large-scale events necessitating the use of military forces, both state and federal, in CM and mitigating the effects of a CBRNE event. Each element of the CBRNE Enterprise has specific capabilities that are of high value in some types of scenarios, but not as much in others. It speaks to the need for a scalable, flexible, and adaptable response to these threats. It is through an approach of combined effort and joint cooperation, coordination, and response that military CBRNE response organizations can best address these potential events.

Evaluation Criteria

In chapter 4, the author uses the scenarios to determine the utility of deploying certain aspects of the CBRNE Enterprise based on anticipated casualties and requirements as mentioned in the NPS. The evaluation criteria will involve the likelihood of using one, several, or all of the available CBRNE forces under the Enterprise and whether the DCRF would have capability and capacity as designed to mitigate the CBRNE aspects of the scenario as the active duty support element given the timeframe of such an event. Table 2 comprises the evaluation criteria according to the element(s) available under the CBRNE Enterprise, their capacity based on personnel and equipment, the timeline for employment, and likelihood for use.

Table 2. Evaluation criteria for CBRNE response elements based on NPS scenarios

Unit	Name of Unit Type	Name of Unit Type	Name of Unit Type	Name of Unit Type	Name of Unit Type	Name of Unit Type
Criteria						
Timeline Needed	Immediately, H+XX Hours, Not Needed					
Typical Employment Timeline	Notification + XX Hours					
Personnel	# Personnel					
Equipment Types	Decon, Analysis/ID, Search/Rescue, Medical, Communications, Aviation, Ground Evac, Security					
C2 Capability	Can C2 XX Units of Y Type					
Decontamination Required?	Based on Scenario: Yes / No					
Decontamination Capability (Rate)	XX persons/12 hour period unrelieved					
Injury Types	Types of anticipated injury for scenario					
Medical Support Required?	Based on Scenario: Yes / No, Type					
Medical Capability	Level of Medical Care Provided					
Unique Capabilities	Any capability unique to unit					
Event Outpaces Capabilities	Likelihood of scenario to overwhelm capabilities					
Decon	Likely (Red), Possibly (Amber), Unlikely (Green)					
Medical	Likely (Red), Possibly (Amber), Unlikely (Green)					
C2 Capability	Likely (Red), Possibly (Amber), Unlikely (Green)					
Requires Higher Level Assistance?	Likely (Red), Possibly (Amber), Unlikely (Green)					

Source: Created by author.

Following this metric, chapter 4 includes analysis of each scenario using the evaluation criteria and makes a qualitative assessment for each CBRNE response element in terms of decontamination, medical, and C2 support capability for the given scenario using the information presented in table 2. As part of each scenario analysis, the requirement to use the DCRF (and subsequently the C2CRE if necessary) and its capacity given the timeframe to respond to the scenario is evaluated. Conclusions drawn from this scenario analysis help to form possible recommendations for employment, training, equipping, and manning for the DCRF in its mission to support CBRNE consequence management at the federal level.

Interview with Assistant Chief Alan Vickery, Seattle Fire Department

Interviews with subject matter experts on the subject of DoD's support to civil authorities in the area of CBRNE response allowed for a more thorough evaluation of the effectiveness of the CBRNE Enterprise. These oral history interviews were conducted in accordance with Army policy and federal law and each interviewee provided informed consent prior to their interview. The first interview, conducted on March 1st, 2013, was with Assistant Fire Chief Alan Vickery of the Seattle Fire Department. Chief Vickery is a former member of the Rand Gilmore Commission on domestic response to WMD and provided testimonial input to the *Fifth Annual Report to the President and the Congress on the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction* in 2003 (RAND 2003, B-7). The interview centered on interoperability and integration between local responders and federal forces under DSCA, but included some discussion of Title 32 force involvement as well. Some major points brought up by Chief Vickery included an observation that one of the major issues with military forces is that they are unable to ramp up very quickly, and that they tend to require a thorough battle plan before going on a mission (Vickery 2013). The slower ramp-up may be attributable to having to gather the forces from several locations, as in the case of the DCRF and C2CRE (JTF-CS 2012). Vickery mentioned that based on his experience, advertisements that a particular force like the HRF can be on site in twelve hours seems a little unrealistic. From the standpoint of the local responder, it also becomes cost prohibitive to bring in DoD forces despite their capability, as the state will more than likely have to pay the reimbursement for the federal forces.

Vickery stated there is also a considerable discrepancy between the training standards of different forces. Local responders do not generally know to what standards the military is training. The expectation of the local responder is that if the DSCA augment is going to work with the local personnel, they have to understand and attempt to train to the same standards, which are universally accepted. For example, when conducting technical rescue operations, the National Fire Protection Association (NFPA) has a standard called NFPA 1670 (NFPA 2009). Responders follow the guidelines in NFPA 1670 to standardize the way they approach a rescue. Likewise, for HAZMAT operations, the standard is NFPA 472 (NFPA 2013). If the military certifies to those standards and abides by them, it would make DSCA integration with local responders easier. Van Alstyne also emphasized this concept in his thesis on HRF standards (Van Alstyne 2012, 3). Working with local responders on exercises is one way to build confidence and trust, but here the issues become availability of the local element for exercises as this takes them away from their normal duties and tends to cost a prohibitive amount (Vickery 2013). According to Chief Vickery, one way to enhance this is to encourage funding to backfill departments so they can free up personnel to go train with state and federal personnel like the WMD-CST, HRF and DCRF (Vickery 2013).

The author spoke to Chief Vickery about issues for each of the CBRNE disciplines: chemical, biological, radiological, and nuclear incidents. Chief Vickery said a prevalent issue in chemical response is the time from the incident to arrival of forces. Unless forces are pre-staged, the military is of diminished value. For biological incidents, there is generally not enough law enforcement and decontamination capability to contain an incident at the local level (Vickery 2013). Here the military can be of significant

value, but transportation and logistics are points of contention. In a nuclear or radiological event, the local responders are essentially non-functional. This will require significant outside assistance, both in CBRNE management and in security due to looting and contaminated individuals (Vickery 2013). For explosives, that is usually well handled by the local authorities, but the military can assist with Explosive Ordnance Disposal (DoD 2013, 29), and may be of utility in port clearance after a sea-based attack or demining. He closed by stressing the importance of partnerships between national and local level responders. The military already does this well overseas in stability operations, and the same theory can apply in the homeland to foster collaboration and build relationships between military and local emergency personnel. The key to success in military DSCA operations, especially at the federal level, is being honest about what can be done and how fast. Setting good expectations will go a long way in ensuring good coordination (Vickery 2013).

Interview with Mr. John Schlafer, DCE Region VII Operations and Plans Officer

The second interview took place May 1, 2013 with Mr. Jon Schlafer, the Operations and Plans Officer for the Defense Coordinating Element (DCE) in FEMA Region VII in Kansas City, Missouri (Schlafer 2013). Mr. Schlafer's particular area of interest is in CBRNE response and this interview dealt with the various structures of the CBRNE Enterprise, including state forces and the integration of the DCRF into DSCA response. Mr. Schlafer started by discussing the state level response forces in the CBRNE Enterprise. He confirmed the expected response timeframes of three hours for the WMD-CST and six-twelve hours for both the CERFP and HRF presented in NORTHCOM

literature (Hessdoerfer 2011) and in National Guard standards (NGB 2009). His view on the WMD-CST is that it is a rapid response assessment and advisory element with little additional DSCA capability. The CERFP and HRF on the other hand have more robust DSCA capabilities that can be used for both CBRNE and non-CBRNE response. Missouri's CERFP, part of Region VII for the DCE, underwent the transition to an HRF recently (Halladay and Staggs 2012). Mr. Schlafer commented that the CERFP and HRF do bring important additional capability, but with traditional Guard personnel and not full-time personnel as seen in the WMD-CST. The idea behind the enhanced HRF design is also to allow for command of other WMD-CST and CERFP elements in a larger incident response (Schlafer 2013).

The Joint Field Office (JFO, where the DCE would be located) requests the federal forces like the DCRF and coordinates with the state and federal coordinating officers. The state's first choice would likely be to request EMAC support for additional assets from adjacent states via pre-established plans (EMAC 2013). Once the available state assets are exhausted or inadequate, then the request for the DCRF would come. An interesting point was the relationship between the JTF-CS commander (who is a two-star general or flag officer and has responsibility for the DCRF element) and the dual-status commander that is commanding Guard response elements (who will likely be a one-star officer). The JTF-CS commander would usually assume a supporting role to the dual-status commander, but the latter only has control over forces in one state (NORTHCOM 2012b). If the incident affects multiple state jurisdictions, the JTF commander may have to provide federal forces across an entire region. A possible solution is for the JTF-CS commander to give tactical control (TACON) requested forces temporarily to the dual-

status commander for the duration of a mission, then receive TACON back when they are mission complete. The C2CRE as an additional federal response element, has enhanced C2 capability and may be directed under JTF-51 (also a two-star billet) to control multiple federalized units, such as HRFs operating under Title 10 should that be determined necessary (JTF-CS 2012).

The strength of the active duty component of the CBRNE Enterprise is the organization's availability and ease to activate the force. The main weakness is that the DCRF and C2CRE constituents are spread out across the country (JTF-CS 2012). Mr. Schlafer mentioned that Vibrant Response is the one time they can bring them all together to operate. According to Mr. Schlafer, the issue is not with the operators at the tactical level. Their training is congruent and they tend to have good interoperability. The potential problem lies with headquarters coordination at the multiple echelons involved in a large exercise like Vibrant Response (Schlafer 2013).

Conclusion

Through looking at the functionality, capability, strengths, and weaknesses of the CBRNE response elements using the NRS as a road map of potential responses, there are scenarios that apply particularly well to one or several elements, but not to others. Many of the issues with response capability and capacity of responding forces lie with the type and size of the incident. The interviews with subject matter experts at the local and federal coordination level provided insight into some of the particular issues in coordinating response with a military force, be it state or federal. Using this methodology, an analysis of the information collected and described thus far is possible,

which will yield recommendations for potential changes, further study, and emphasis in future training and organizational planning and design.

CHAPTER 4

ANALYSIS

Introduction

The goal in this analysis is to determine what possible solutions might be available to increase the efficiency and effectiveness of the DCRF and it and how it can best be utilized individually and in tandem with other CBRNE response elements. Basing this analysis on the strengths, weaknesses, gaps, and redundancies previously discussed in the methodology and against the National Planning Scenarios creates a robust idea of how the effectively the elements organize for operations of various types. Using the scenarios discussed in the methodology, the strengths, weaknesses, requirements, and capabilities of the CBRNE response elements can be evaluated against the factors of the selected scenarios. This allows for an estimation of the effectiveness of the response force. Each NPS discussed in Chapter 3 is used to evaluate the various CBRNE response elements as previously described, and compare the ability of the type of element to deal effectively with the scenarios based on decontamination, medical, and command and control capabilities. In the analysis, any unique capabilities of a particular CBRNE response element are taken into consideration to make a determination whether additional, higher level assistance is likely to be required. The analysis will include effective measures for federal and state command of Title 10 (active) and Title 32 (state) forces to avoid inter-state conflicts. This step will outline possible avenues to streamline resourcing for the active component CBRNE forces, the DCRF and C2CRE.

The author will discuss ways that the DCRF can train together with other CBRNE response elements to develop shared understanding and to foster collaboration for the

possibility of future operations together. An investigation of prior training exercise results and joint training events will act as a baseline for building a recommended method to increase joint Title 10–Title 32 cooperation in training in partnership with other local, state, and federal agencies. As mentioned in the interviews with Chief Vickery (2013) and Mr. Schlafer (2013), this partnership between elements is crucial for effective response.

Comparison of CBRNE Response Elements Against the National Planning Scenarios

The author seeks to evaluate the applicability of Each CBRNE response unit to the scenario and assess the efficacy of each unit in terms of providing three major requirements for effective consequence management activity at a major CBRNE event. These consist of the capability to conduct decontamination, provide medical treatment for casualties (in scenario 14, veterinary support), and command and control forces, be they active, reserve, or Guard. Each element is not able to conduct the full range of CBRNE activities. On the contrary, each element has unique qualifications in terms of personnel, equipment, and employment timeline that affect when and how it is used. The CBRNE Response Team of the TEU, for example, is oriented toward mitigation of CBRNE hazards before they create a dispersed effect on a population, but they also have utility after an incident in many cases (Colyer 2001, 69). The concept is to compare these elements against a recognized standard for potential consequence management employment, and that exists within the NPS (DHS 2006). These are the standards not only used for developing response plans at the local, state, and federal level, they also

form the basis for exercising responding authorities (including federal forces) at major exercises like Vibrant Response (Van Camp 2012).

In all three scenario comparisons, the analysis is based on the inherent capabilities of each CBRNE response element as discussed in Chapter 2, and in accordance with the research material as previously discussed. The capabilities comparison, seen in table 2, acts as a baseline for each unit as it is compared against the scenario. The author analyzed each response element in terms of its likelihood to be able to handle the decontamination, medical, and C2 aspects of the given scenario. Should a response element be likely to be unable to handle the scenario in one or more of the three factor categories, it would require the request of additional assets.

The author assessed the three concentration areas as being either “likely”, “possibly”, or “unlikely” to have their capability overwhelmed by the scenario factors as outlined in Chapter 3. In each scenario table, the result for each concentration area was recorded with the color red for “likely” for that capability to be overwhelmed (75 percent or more likelihood), amber for “possibly” overwhelmed (25 to 74 percent), and green for “unlikely” to be overwhelmed (less than 25 percent likelihood). Finally, the author entered the probability of requiring additional assistance from another echelon or similar units as the color red for “likely” to need additional force assistance, amber for “possibly” requiring assistance, and green for “unlikely” to require additional assistance. For example, if a certain CBRNE response element were able to decontaminate 150 persons in a twelve hour period, and an event required an immediate response due to the catastrophic or potentially catastrophic nature of the event to decontaminate 750 persons in a twenty-four hour period, it would be assessed as “likely” (red, or over 75 percent)

that the element's decontamination capability would be overwhelmed and it would be unable to manage the decontamination aspect of the mission. Likewise, it would also increase the likelihood that the element would require higher assistance to provide adequate consequence management support capability. Whenever an element has a difference in assessments for one or more of the factors, the preponderance of answers will dictate the overall likelihood of requiring assistance beyond the unit capability. For example, a response element with two or more factors assessed as "likely" would also result in an outcome of "likely" for requiring higher assistance. If there are three different assessments for the three factors (one of each color), the likelihood of requiring higher assistance will be the mean, in this case "possible" (amber) as this is the median outcome.

Scenario 1 Analysis

The first scenario comparison, using NPS Scenario 1, the ten-kiloton nuclear explosion, the nature of the event requires a significant response from the outset due to the massive destruction and probable casualties from this type of incident. As indicated in chapter 3, nearly 205,000 fatalities and over 295,000 total casualties would be expected in the metropolitan area (DHS 2006, 1-17). These casualties are from all factors, including radiation, thermal effects, blast damage, structure collapse, fires, and other secondary effects. This number of victims will easily overwhelm local responders, who are likely to suffer psychological effects from impacts to their neighbors, friends, and family (Mathewson 2004, 197). In this case, the initial response would likely be much more robust, but for the purposes of this analysis, each element is responding to the incident in turn, according to the CBRNE Enterprise. In the case of the TEU and CBIRF elements, they are included as though they are responding under an immediate

emergency response protocol to mitigate human suffering and save lives, permissible for the first 72 hours under DSCA execution order (DoD 2011a, 22) and regulation (DoD 2012c, 5). The units have been inserted into the comparison matrix based on their comparative size to the other elements, from smallest to largest. Table 3 shows the elements when analyzed against scenario 1.

Table 3. Comparison of CBRNE response elements based on NPS scenario 1: Detonation of a 10 kiloton improvised nuclear device in a metropolitan area

Unit	CRT (TEU)	WMD-CST	CERFP	CBIRF	HRF	DCRF	C2CRE
Criteria							
Timeline Needed	Immediately	Immediately	Immediately	Immediately	Immediately	Immediately	Likely H + 48 hours
Typical Employment Timeline	Notification + 24 hours	Notification + 3 hours	Notification + 6-12 hours	Notification + 12-24 hours	Notification + 6-12 hours	Notification + 24-48 hours	Notification + 96 hours
Personnel	15	22	180+	200-250 per IRT (2)	560+	5200 (over two phases)	1500
Equipment Types	Limited Decon, Analysis/ID, Search/Rescue, Communications	Analysis/ID, Communications	Decon, Search/Rescue, Limited Medical, Ground Evac	Limited Analysis/ID, Decon, Search/Rescue, Limited Medical, Communications	Decon, Search/Rescue, Limited Medical, Robust C2, Ground Evac	Decon, Search/Rescue, Analysis/ID, Medical, Robust C2, MEDEVAC, Aviation Lift, Security	Additional Decon, Search/Rescue, Analysis/ID, C2, Medical, Logistics
C2 Capability	No C2 Capability	No C2 Capability	Multiple CSTs	Can C2 small units (TEU, Additional Marines)	Can C2 Multiple CERFPs and CSTs	Can C2 active duty forces including TEU and Reserves	Can C2 as a JTF HQ, all federalized forces
Decontamination Required?	Yes						
Decontamination Capability (Rate)	40 Persons, not long term	None beyond self	450 persons in 12 hours	1800 persons in 12 hours	450 persons in 12 hours	2700 persons in 12 hours	20-30% increase from DCRF
Injury Types	Blunt Trauma, Heat and Radiation Burns, Radiation Sickness, Psychological Trauma						
Medical Support Required?	Yes, Levels I-III, Surgical, Air and Ground Evac						
Medical Capability	Basic Aid Only	Basic Aid Only	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Level I-III, Surgical, Air and Ground Evac	Additional Level II Medical, Ground Evac
Unique Capabilities	Radiological Search, Measurement, Confined Space, Explosives/Device Handling	Radiological Search, Measurement	Collapse Extraction, Confined Space	Radiological Search, Some Measurement	Collapse Extraction, Confined Space, Security, C2 package	Medical-Surgical, Security, Aviation Lift/MEDEVAC	JTF HQ C2, Medical, Logistical
Event Outpaces Capabilities	Likelihood of scenario to overwhelm capabilities						
Decon	Likely	Likely	Likely	Likely	Likely	Likely	Likely
Medical	Likely	Likely	Likely	Likely	Likely	Likely	Likely
C2 Capability	Likely	Likely	Likely	Likely	Likely	Possibly	Unlikely
Requires Higher Level Assistance?	Likely	Likely	Likely	Likely	Likely	Likely	Likely additional forces

Source: Created by author.

The results of the evaluation against this scenario are not unexpected. Even a small nuclear device detonation in a major metropolitan area would have significant if not devastating effects physically on structures (DHS 2006, 1-24), the environment (DHS 2006, 1-10), long-term human health (DHS 2006 1-11), and psychology (Mathewson

2004, 197). In such a case, the decontamination, medical, and C2 capability of the TEU, WMD-CST, CERFP, CBIRF, and HRF would all be quickly overwhelmed due to the sheer numbers of people affected (DHS 2006, 1-6) and the massive response required. Activation of the DCRF would be necessary in this case and even then the size of the patient pool outstrips its decontamination and medical capability (DHS 2006, 1-39). Much of the CERFP and HRF capacity would be dedicated to collapse extraction and search and rescue due to the large-scale structural damage expected, and that would only be possible in the less contaminated zones (DHS 2006, 1-5). The area around ground zero would be difficult to approach without significant shielding for several days to weeks, especially with significant fallout (DHS 2006, 1-9). In this scenario, escalation all the way up to the C2CRE for additional decontamination, medical, and C2 support is likely necessary. The situation may require augmentation beyond the C2CRE for decontamination relief and supplementary medical personnel (Reyes 2012). In this case, the DCRF does not have adequate decontamination capacity to handle the number of casualties at the incident with a response at twenty-four to forty-eight hours from notification, the normal timeline expectation for the DCRF (Hessdoerfer 2011). Too much of a delay could lead to significant loss of life due to contamination, trauma from structural collapse, and thermal injury (DHS 2006, 1-9). This scenario represents what is most likely the NPS worst case for rapidly exceeding the capabilities of all of the designated military response elements, and would necessitate significant augmentation under the auspices of either JTF-CS or JTF-51 acting as the C2CRE command element. The state entity involved could request additional CERFP or HRF assets from adjoining states through an EMAC request (EMAC 2013). Although other governors might honor

some of these requests, it is possible that other states may keep a portion or all of their consequence management forces in the expectation that another incident of a similar nature could be forthcoming. Even if an adjoining state Governor provided additional CERFPs or HRFs to the affected state or region, there would likely still be a lack of adequate assets, necessitating the use of the DCRF and C2CRE(s) for support.

Scenario 2 Analysis

The second scenario comparison uses NPS Scenario 2, the dissemination of 100 liters of weaponized anthrax bacteria during rush hour in a large city. In this case, the attack is much more insidious and would take some time, potentially several days, for symptoms to appear and for the event to be recognized as a biological attack (CDC 2013). According to the Centers for Disease Control and Prevention (CDC), the average incubation period for signs or symptoms to appear with inhalational anthrax (the most deadly of three forms) is less than a week, but can be prolonged (CDC 2013). With gastrointestinal anthrax, it is usually one to seven days, depending on the host (CDC 2013). Cutaneous anthrax (the least severe route of infection) can appear in a day or two, but is less common as it has to penetrate a cut or open wound (CDC 2013).

In this scenario, the time to onset of symptoms from the dissemination of the agent *Bacillus anthracis* is near the median of the expected incubation period at thirty-six hours post-exposure (DHS 2006, 2-2). All of the exposed persons in this scenario would be expected to have been exposed to the original source as the more serious forms of the disease, inhalational and gastrointestinal, are not spread from host to host (CDC 2013). The cutaneous version infrequently spreads through direct contact, but this would be more of a threat to health care workers and first responders than to the general

population. As mentioned in chapter 3, the expected number of casualties is approximately 13,000 fatalities or injuries requiring hospitalization (DHS 2006, 2-1). In addition, there would be thousands more requiring decontamination. This would include not just those in the immediate area of the attack, but countless others who may believe they had an exposure, an effect seen in the Tokyo Sarin attacks (Mathewson 2004, 197). Even though person to person transmission of anthrax spores would be extremely rare, decontamination of possibly hundreds of thousands might be necessary as well as decontamination of surfaces in the affected area based on downwind conditions. As opposed to scenario 1, under which massive structural damage is anticipated, with a biological agent such as *B. anthracis* there would be no structural effect but significant contamination of surfaces (DHS 2006, 2-5).

In scenario 1, the destroyed and contaminated area would have to be abandoned for a period of time based on residual radiation and fallout effect, but in scenario 2, the area maintains structural integrity (DHS 2006, 2-6). This relieves the vast majority of the search and rescue requirement from responders, which the incident commander can redirect to decontamination efforts. Decontamination in this event is necessary for a quick recovery as this will support economic stability and reduction of psychological effects to the affected area (DHS 2006, 2-6). In addition, it is possible that many of those decontaminated rapidly might not contract more serious forms of the disease, especially with concomitant administration of medical countermeasures (DHS 2006, 2-4). The scenario 2 comparison of CBRNE elements and analysis for this type of attack is presented in table 4.

Table 4. Comparison of CBRNE response elements based on NPS scenario 2: Dissemination of 100 liters of weaponized anthrax in a large city during rush hour

Unit	CRT (TEU)	WMD-CST	CERFP	CBIRF	HRF	DCRF	C2CRE
Criteria							
Timeline Needed	Immediately	Immediately	H+ 6-12 hours or as soon as agent identified	H + 6-12 hours or as soon as agent identified	H + 6-12 hours or as soon as agent identified	H + 12-24 hours, to assist in decon, medical and C2	Decon/Med Capability may be needed in 24-48 hours
Typical Employment Timeline	Notification + 24 hours	Notification + 3 hours	Notification + 6-12 hours	Notification + 12-24 hours	Notification + 6-12 hours	Notification + 24-48 hours	Notification + 96 hours
Personnel	15	22	180+	200-250 per IRT (2)	560+	5200 (over two phases)	1500
Equipment Types	Limited Decon, Analysis/ID, Search/Rescue, Communications	Analysis/ID, Communications	Decon, Search/Rescue, Limited Medical, Ground Evac	Limited Analysis/ID, Decon, Search/Rescue, Limited Medical, Communications	Decon, Search/Rescue, Limited Medical, Robust C2, Ground Evac	Decon, Search/Rescue, Analysis/ID, Medical, Robust C2, MEDEVAC, Aviation Lift, Security	Additional Decon, Search/Rescue, Analysis/ID, C2, Medical, Logistics
C2 Capability	No C2 Capability	No C2 Capability	Multiple CSTs	Can C2 small units (TEU, Additional Marines)	Can C2 Multiple CERFPs and CSTs	Can C2 active duty forces including TEU and Reserves	Can C2 as a JTF HQ, all federalized forces
Decontamination Required?	Yes						
Decontamination Capability (Rate)	40 Persons, not long term	None beyond self	450 persons in 12 hours	1800 persons in 12 hours	450 persons in 12 hours	2700 persons in 12 hours	20-30% increase from DCRF
Injury Types	Delayed Pulmonary or Gastrointestinal Distress, Malaise, Incapacitation, Cutaneous Anomalies						
Medical Support Required?	Yes, Levels I-III, Surgical, Air and Ground Evac						
Medical Capability	Basic Aid Only	Basic Aid Only	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Level I-III, Surgical, Air and Ground Evac	Additional Level II Medical, Ground Evac
Unique Capabilities	Rapid Biological Measurement, Confined Space, Explosives/Device Handling	Rapid Biological Measurement	None to scenario	Some Measurement	Security, C2 package	Medical-Surgical, Security, Aviation Lift/MEDEVAC	JTF HQ C2, Medical, Logistical
Event Outpaces Capabilities	Likelihood of scenario to overwhelm capabilities						
Decon	Likely	Likely	Likely	Likely	Likely	Likely	Possibly
Medical	Likely	Likely	Likely	Likely	Likely	Likely	Unlikely
C2 Capability	Likely	Likely	Likely	Likely	Likely	Possibly	Unlikely
Requires Higher Level Assistance?	Likely	Likely	Likely	Likely	Likely	Likely	Unlikely

Source: Created by author.

In scenario 2, the provision of medical support is critical to the success of the CM effort. The assets of the TEU and WMD-CST would be very important in the initial stages of this event as they can provide on-site presumptive analysis of the agent involved. Both have the capability to identify and provide initial feedback as to the nature of the attack to allow for activation of necessary follow-on military and civilian support (Metcalf 2012). The activation of CERFP and HRF elements is important for providing rapid decontamination support and if necessary, additional security assets, as well as initial site C2. The CBIRF may also be useful in response support, both in decontamination and in initial medical support to local health care officials, especially if

such an event were in the national capital region or affecting federal assets. However, due to the numbers of affected persons (DHS 2006, 2-1), this event requires the activation of the DCRF. In this scenario, the response timelines of military elements are more in line with their normal employment schedules per the CBRNE Enterprise framework (Reyes 2012) due to the delayed onset of symptoms. The TEU and WMD-CST elements' analytical capabilities are likely to be required rapidly upon notification of a probable attack unless previously confirmed by a health care laboratory or public health authority due to patient signs and symptoms.

Depending on how quick the situation can be contained and how well the local authorities do in channeling those suspected of exposure into decontamination and medical treatment areas, the DCRF may be the highest level support element required. Additional CERFP or HRF assets are necessary for mass decontamination efforts. However, it is possible that with near 13,000 affected people, the incident commander may request incorporation of some medical elements of the C2CRE and the United States Public Health Service. The C2 capability of the DCRF may be adequate, but the inclusion of additional decontamination and medical assets necessitates the use of the C2CRE C2 element to form a JTF with the DCRF (Van Camp 2012, 15). In this scenario, there is much less overall destruction but the detection, decontamination, and countermeasures for an attack of this nature are more complicated than in scenario 1. The DCRF in this case is important for medical support and C2 functions, but additional decontamination and medical support is required due to the expected outflow of displaced persons from the affected area (DHS 2006, 2-1). Decontamination of those who think they may be

contaminated is necessary as it is virtually impossible and cost prohibitive to test every individual for exposure to the disease vector.

Scenario 14 Analysis

The third scenario comparison uses NPS scenario 14, the infection of livestock with FMD, a foreign animal disease. The author chose this scenario as it deals with a more unconventional use of WMD agents, a disease vector that can cause major economic and psychological disruption rather than human casualties (DHS 2006, 14-5). As discussed in chapter 3, this is a dissemination of disease in several locations in several states simultaneously (DHS 2006, 14-1). The challenge in this scenario is not only identification of the disease as it is not one that is typical of a WMD agent, but also the time between dissemination and detection of symptoms in the affected animals. As it is a highly contagious and lethal disease in livestock (WA DOH 2002), limiting its spread early is the key to preventing a significant economic effect domestically and on the reputation and commerce of American livestock products overseas. The economic effect of even a moderate outbreak in the United Kingdom of this disease had a heavy economic toll (Rubel 2003). Other animal diseases like Bovine Spongiform Encephalopathy (Mad Cow Disease), which had smaller outbreaks, severely damaged the commerce of domestic beef commodities worldwide (Coffey et al. 2005, 4).

In scenario 14, the element of multiple attacks in several jurisdictions complicates the response effort and overall command and control. Each state could, theoretically, attempt to handle its own outbreak issues, but the interstate transport of livestock coupled with the need to develop a coordinated containment plan of action necessitates cooperation among all affected jurisdictions. Since this event does not list a specific

assessment for numbers of livestock affected, the example of the 2001 United Kingdom outbreak provides a good case study (Rubel 2003). Here the source was a single point of FMD in Cumbria, in the north of England (DEFRA 2001). The initial reproductive rate, or ability of the single infection to induce infection in other like organisms, was 9.8. In other words, one source infection would produce disease in 9.8 other animals each infective generation (Rubel 2003). Due to early recognition of disease and culling applied to infected herds (often the only way to limit spread), this dropped to a reproductive rate of 4 by the end of the first week following recognition of symptoms (Rubel 2003). Even so, the reproductive rate at the end of fifteen weeks of infection was still near 2. By the end of seven weeks, that single farm infection had spread to over 160 farms (Rubel 2003).

Using this model, assuming three points of infection with substantial interstate travel per the scenario (DHS 2006, 14-1), at the end of week one at least thirty locations would be infected. Even with early response measures (as seen in England), a reproductive rate of 4 after one week means that a total of 120 farms would have infections by the second week. This could affect hundreds or thousands of additional farms within six to seven weeks, even with a concerted effort to limit spread. Should health authorities fail to identify the causative agent quickly or track where affected livestock travelled, the damage could be significant.

The 2001 outbreak in England affected farms all over the country and caused lasting economic damage (Rubel 2003), and that was a much smaller-scale event from a single source of infection. As human interaction further complicates the spread between livestock, there are additional concerns regarding contamination spread that need to be

considered. Local authorities will need support to decontaminate farms that have had disease outbreaks to prevent resurgence. They will also need assistance decontaminating persons transiting to and from affected farm regions acting as potential disease carriers, and in assessing and disposing of contaminated livestock (DEFRA 2001). The comparative analysis of CBRNE response elements for scenario 14 can be seen in table 5.

Table 5. Comparison of CBRNE response elements based on NPS scenario 14: Release of Foot-and-Mouth Disease in livestock in multiple locations

Unit	CRT (TEU)	WMD-CST	CERFP	CBIRF	HRF	DCRF	C2CRE
Criteria							
Timeline Needed	Upon indications of widespread disease	Upon indications of widespread disease	Immediately, for exposure decon	Immediately, for exposure decon	Immediately, for exposure decon and security	H + 24-48 hours for decon, security, C2	If necessary, within H + 96 hours
Typical Employment Timeline	Notification + 24 hours	Notification + 3 hours	Notification + 6-12 hours	Notification + 12-24 hours	Notification + 6-12 hours	Notification + 24-48 hours	Notification + 96 hours
Personnel	15	22	180+	200-250 per IRT (2)	560+	5200 (over two phases)	1500
Equipment Types	Limited Decon, Analysis/ID, Search/Rescue, Communications	Analysis/ID, Communications	Decon, Search/Rescue, Limited Medical, Ground Evac	Limited Analysis/ID, Decon, Search/Rescue, Limited Medical, Communications	Decon, Search/Rescue, Limited Medical, Robust C2, Ground Evac	Decon, Search/Rescue, Analysis/ID, Medical, Robust C2, MEDEVAC, Aviation Lift, Security	Additional Decon, Search/Rescue, Analysis/ID, C2, Medical, Logistics
C2 Capability	No C2 Capability	No C2 Capability	Multiple CSTs	Can C2 small units (TEU, Additional Marines)	Can C2 Multiple CERFPs and CSTs	Can C2 active duty forces including TEU and Reserves	Can C2 as a JTF HQ, all federalized forces
Decontamination Required?	Yes, to prevent spread						
Decontamination Capability (Rate)	40 Persons, not long term	None beyond self	450 persons in 12 hours	1800 persons in 12 hours	450 persons in 12 hours	2700 persons in 12 hours	20-30% increase from DCRF
Injury Types	Animals - Fever, Respiratory Difficulty, Death Humans - likely none						
Medical Support Required?	Veterinary Support						
Medical Capability	Basic Aid Only	Basic Aid Only	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Triage, Basic EMS, Ground Evac	Level I-III, Surgical, Air and Ground Evac, Can bring Vet Care	Additional Level II Medical, Vet Care, Ground Evac
Unique Capabilities	Biological Measurement, Hazardous Device Exploitation	Biological Measurement	None to this scenario	None to this scenario	Security, C2 package	Medical, Security, Aviation Lift/MEDEVAC, Logistical	JTF HQ C2, Medical, Logistical
Event Outpaces Capabilities	Likelihood of scenario to overwhelm capabilities						
Decon	Likely	Likely	Likely	Likely	Likely	Possibly	Possibly
Medical	N/A	N/A	N/A	N/A	N/A	Likely - Vet/Med	Possibly - Vet/Med
C2 Capability	Likely	Likely	Likely	Likely	Likely	Possibly	Unlikely
Requires Higher Level Assistance?	Likely	Likely	Likely	Likely	Likely	Possibly	Possibly

Source: Created by author.

In this analysis, the medical response capabilities of all elements prior to activation of the DCRF are not as useful as these capabilities provide for human health requirements. This scenario requires the use of veterinary care for both diagnosis and

treatment (USDA 2013, 2). The TEU and WMD-CST elements can be useful for assisting in animal health surveillance with proper training. The CERFP, CBIRF, and HRF elements would be useful in decontamination of persons transiting out of affected agricultural zones and could provide additional logistical support in mitigating and disposing of affected diseased animals, which might be a significant undertaking based on the expected numbers of infected livestock (Rubel 2003). The HRF's security element, kept at the state control level, could support law enforcement efforts in establishing quarantine zones and limiting the transit of animals suspected of carrying infection, in concert with agricultural health authorities.

Here the utility of the DCRF is both as a C2 asset for assisting FEMA in coordinating military support to the cooperative effort between states and as a medical asset. The DCRF commander can provide additional medical assets for animal health and, with proper training, human providers acting temporarily in an animal health role. However, this is likely limited as the DCRF carries only one medical brigade's assets (JTF-CS 2012). Depending on the spread of the disease, it will be necessary to request additional medical assets through the C2CRE and Public Health Service and place them under the command of the JTF as an overall uniformed response coordination authority (Van Camp 2012, 15).

Decontamination of persons transiting affected areas can be accomplished by the CERFP and HRF in their home states (or by EMAC in states not possessing either) with support from DCRF assets. The critical factor in this scenario is the recognition of disease and prevention of spread, as an infected animal is difficult to salvage (USDA 2013, 2). This means that animal health surveillance, provision of medical support, and

decontamination are all important for the success of any CBRNE effort in combating FMD spread.

Effectiveness, Suitability, and Survivability

The *National Strategy for CBRNE Standards* lists three key factors when fielding and equipping a CBRNE response contingent. The first is effectiveness, or whether the element has the tools to ensure sensitivity, specificity, and response time to ensure accurate results. The second is suitability, or the reliability, interoperability, and applicability to the mission of the particular equipment. The third is survivability, or how safe, rugged, and dependable the equipment is under the extreme operating conditions expected in a CBRNE response (Homeland Defense Subcommittee 2011, 9). When looking at the various response elements, a primary concern is the interoperability between the various equipment types. Much of the equipment used by responding forces at the state and federal level is commercial-off-the-shelf. Although this is generally consistent in terms of equipping across a local jurisdiction, a state, or a federal entity, it does not mean that this equipment is consistent between these levels. Loan of this equipment or operation of this equipment by other entities may prove problematic without significant training time in the event of a collaborative response effort.

Although the military standard issue equipment utilized across the CBRNE Enterprise response elements is generally consistent, such as the Joint Chemical Agent Detector or the Improved Chemical Agent Monitor, this is not necessarily true for commercial equipment (ATEC 2012, 20). The consistency in commercial equipment is greatest between the full-time components, such as the TEU, WMD-CST, CBIRF, and the chemical battalion portion of the DCRF (ATEC 2012; Shenefelt 2007). In addition,

elements such as the CERFP and HRF have limited radiological instrumentation (Dodson 2007) and would therefore be limited as to the extent they could be used for radiological survey and assessment, possibly necessitating higher level support and additional equipment provision.

In terms of effectiveness, the elements field equipment based on their particular mission sets. The TEU and WMD-CST carry technical identification and analysis equipment (Shenefelt 2007). For the CERFP and HRF, this would be a mixture of rescue, confined space, and decontamination equipment types (Dodson 2007). For the CBIRF, it is a mixture of detection, rescue, and decontamination equipment as well as some logistical assets (Broyles 2009, 6). For the DCRF, it encompasses detection, rescue, medical, decontamination, and logistical assets (which also applies to the C2CRE) (Van Camp 2012, 15). The issues in decontamination equipment effectiveness (based on the throughput capability of the particular unit) are not in utility or interoperability. Any decontamination-trained operator can readily use most decontamination equipment. A CERFP or HRF, able to decontaminate 450 persons in a 12 hour period (Hessdoerfer 2012), would only have equipment scaled for the 45 personnel assigned to conduct that part of the mission. Therefore, the equipment shortage would limit that element to providing throughput based on personnel manning without significant reinforcement and logistical support. This makes it possible that a major event could precipitate the need for federal assistance by the DCRF or other assets earlier than expected.

Finally, when considering the survivability of an element's equipment, operational conditions dictate its longevity (ATEC 2012). The same consideration pertains to local or state-level responders' other supplies. If the armory, base or depot is

in close proximity to the attack site, even in the biological scenario, it is possible that equipment may already be contaminated or destroyed and therefore limit the ability of the responders (likely coming from multiple locations in the case of the CERFP or HRF) to execute their mission effectively. This may again require additional outside assistance.

Cost Considerations

There are many considerations when determining the need or requirement for a response by state or federal forces to a DSCA mission, be it of a CBRNE nature or not. In the case of the WMD-CST, a full-time state level response force, the costs are not as much in providing response, but in training and maintaining a highly technical capability (Metcalf 2012). The same applies at the federal level for the TEU (Colyer 2001, 69). This is practically a matter of budgeting, not of reimbursement. At the local and state level, the declaration of a disaster by the governor of the state opens up certain funding streams for response support efforts by elements like the CERFP and HRF. If the local authorities request the response before an executive declaration, then there generally must be a reimbursement scheme in place to provide for paying for the personnel and equipment involved in supporting the local authorities (DoD 2012c, 4). For many municipalities, this could be cost prohibitive. Therefore, it is incumbent upon the state emergency management authority and state coordinating officers to keep local entities informed and advised as to feasible courses of action (Schlafer 2013). Provided there is a disaster declaration, more avenues are open to the incident commander to obtain state level assistance under the emergency management plan. FEMA and the DCE coordinate the response if federal assistance is required, provided either a state request is made to the President or the President unilaterally declares a federal disaster (DoD 2008b, 68). In all

three scenarios presented here, it is likely that federal declarations would be made either by request or automatically based on the circumstances (such as in the nuclear detonation). The federal government will then largely assume costs for the federal response (Schlafer 2013). Reimbursement would mainly be of concern in the immediate aftermath of an incident requiring urgent response by federal forces to save lives and prevent suffering under an installation commander's authority (at least until the President declared a disaster). As the most important consideration following an incident is to limit the damage and suffering, acting to mitigate the incident is of primary consequence. Affected parties can work out reimbursement procedures at a later time.

A second aspect in considering costs is the cost of training, equipping, and maintaining the forces involved. Maintenance of a highly technical force like those that deal with CBRNE incidents can be expensive. The total funding for DSCA for the fiscal year 2011-2015 period amounted to $588 million, including the provision of the ten newly created HRFs (Van Camp 2012). As part of that funding, this budget must provide for the equipment, training and validation of these forces. One of the culminating exercises for CBRNE forces is Vibrant Response, which is an opportunity to test the interoperability and coordination between local, state, and federal forces in a single exercise (Burke 2013), but unfortunately, this only happens annually. In fact, as Colonel Van Camp points out, ARNORTH only allocates four major exercises per year at all levels, which is a significant constraint upon interaction between all of the levels of forces in a shared training experience (Van Camp 2012, 25). This is no doubt affected by funding, and the current and possible future budget constraints placed upon DoD may limit that interaction further, as well as affect force structure for response. CBRNE forces

require consistent, regular training to maintain proficiency, and this costs a substantial amount of money. Fiscal concerns only further highlight the need to find ways to streamline and combine training between elements in order to capitalize on the few opportunities that are available to train such forces.

C2 Considerations

The final factor in this analysis is the applicability of command and control over responding military units. In any event of this type, the overall incident command lies with the local or regional authorities. The state and federal forces are intended to support the local or regional response as additional responders, sustainers, and administrators in the event of activation. In this way, the incident commander does not exercise command authority over the military force, but rather controls the coordination elements at the site or command post and requests assets to complete actions. In the case of a small element like the WMD-CST or TEU, this may involve a direct link between the officer in charge of the element and the incident commander in order to provide immediate feedback, analysis, and advice. In the case of the CERFP or HRF, this is a link between the state coordinating officer, the state joint force headquarters and the commander of the National Guard force. In a case involving both federal and state assets, the appointment of a dual-status commander may be necessary, where an active duty or reserve/National Guard component officer (typically a general officer) exercises simultaneous but separate authority over both state and federal forces (NORTHCOM 2012b, 1-11). These forces can coordinate and work together, but under separate state or federal orders from the same commander. When a major incident requires the involvement of a substantial number of federal forces, such as the DCRF and C2CRE, then an entity like JTF-CS

becomes involved. JTF-CS coordinates federal military response efforts for DSCA in consultation with the DCE (Gray 2012, 27). In this case, the DCRF commander answers to the JTF-CS commander as the supporting force headquarters. The DCRF commander could also be responsible to the dual-status commander as the supported force headquarters, but only to the extent that the dual-status commander utilizes his forces and then returns those forces to the federal support pool under JTF-CS. Although this can create a complicated relationship and requires a concerted effort to keep all parties informed, the key to success in such instances is the exercising of this concept in joint, multi-agency training opportunities like Vibrant Response (Burke 2012).

Conclusion

The comparative analysis of the elements in this chapter shows that in all three scenarios, the response elements have varying utility, but all have practical application to the incident. The trend is that with these national level scenarios, local and state responses could be inadequate and require the use of federal forces to some extent, possibly more than the DCRF can provide as currently resourced. Coupled with equipping, training, and C2 considerations, it is now possible to draw conclusions about the capability and efficacy of the DCRF and other federal forces in providing support to these types of incidents. Although the DCRF and C2CRE are robust and capable elements, they are new and susceptible to the same budgetary constraints that are affecting maneuver formations in the military. In addition, these CBRNE forces need the opportunity to interact and train with the other components of the response framework that they will be supporting, as the day of the incident is far too late. Exercising this

integration, interoperability, and C2 structure will help to ensure a smooth incorporation of federal response into the incident.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Chapter 4 included an assessment of the CBRNE Enterprise response elements against NPS scenarios 1, 2, and 14. The comparative analysis demonstrated that in different ways, each scenario outpaced the response capability of many of the CBRNE elements due to decontamination, medical, or C2 requirements. Keeping in mind that these factors are not the only expectations of responding forces, they help form a more complete picture of what strengths and gaps might exist both within the state and federal response forces. The analysis suggests that the DCRF, as organized under the CBRNE Enterprise, lacks capacity to support DSCA operations for national-level response scenarios. This chapter summarizes the information collected in the prior chapters and discusses some ideas for enhancing the current military CBRNE consequence management response system and the DCRF to address this issue.

Results of Analysis

The analysis from chapter 4 displays that the CBRNE response elements, especially those under the CBRNE Enterprise (the WMD-CST, CERFP, HRF, DCRF and C2CRE) are suited to the types of missions envisioned as a result of the NPS possibilities, and are likely to be used thoroughly in the event of a large-scale event as these scenarios suggest. However, these comparisons also reveal that they may quickly run short on resources to execute a thorough prosecution of the event to allow transition to recovery efforts. The analysis demonstrated that problems do not lie primarily in intent, suitability,

or capability, but rather in anticipated capacity–the ability to execute the mission effectively with resources on hand.

Looking at scenario 1, the result of even a relatively low-yield improvised nuclear device in a metropolitan area would outstrip the decontamination and medical capacities of responding organizations all the way through the CBRNE Enterprise components (DHS 2006). This is based on the anticipation of hundreds of thousands of casualties who would require rapid decontamination and treatment in order to remove radioactive contamination. With such contamination, time equates to lives. The longer the exposure period, the higher the likelihood of both acute radiation sickness and long-term health effects (DHS 2006, 1-25). Excessive numbers of contaminated persons burden an already strained health care system in the region and over time lead to exorbitant care costs to deal with the legacy health problems left from the event. In such an event, the local medical system probably has physical effects from the detonation. The number of patients requiring direct medical intervention for treatment of physical wounds and radiation poisoning may overrun those locations not damaged. This patient load does not include the countless others who would assume exposure, either correctly or falsely, and need some sort of care or consultation (Mathewson 2004).

As the lower-level response forces, such as the CERFP and HRF, do not carry a high number of medical responders, there would be few personnel available for anything above basic initial aid from a medic or nurse (Sidwell 2008). These forces would also be largely dedicated to rescue efforts in the aftermath of structural damages from the detonation. The importance of rapid response and support from the DCRF and subsequent C2CRE forces is apparent in this case, especially in light of the additional

active Medical Brigade that Army Forces Command assigned to support the DCRF mission (JTF-CS 2012). The addition of rotary-wing air rescue to recover persons from isolated area, or following structural rescue is critical to mitigating suffering. This aviation capability is specific to the DCRF (Hessdoerfer 2012). In the case of the current DCRF rotation, this aviation unit is a reserve aviation brigade (Brown 2013), which complicates response time constraints as it would take time to gather the aviation personnel from reserve status. It is possible that the JFHQ could temporarily attach National Guard aviation units in states that possess them to responding forces, but this assumes such forces would be available and not be dedicated to other mission requirements.

Another consideration is the availability of logistics and transportation assets to the response elements in scenario 1. In a nuclear event, there will likely be far more persons fleeing the affected and surrounding areas than are technically contaminated. To ensure the prevention of health effects and limit the spread of contaminated material (especially that worn or carried by anyone exposed to fallout), nearly everyone within a designated zone requires decontamination based on the downwind hazard area (DHS 2006, 1-31). Such an effort requires substantial logistics capability and transportation assets to funnel the affected into decontamination areas and onward to temporary shelter. The HRF carries an enhanced logistics capability, but this is incumbent on the responding state's Guard organization as its personnel draw from regular Guard forces within the state (Dall 2011, 71). The destructive effects of the event may destroy or render assets unusable, complicating the availability of logistics to get equipment. The DCRF carries a Brigade Support Battalion and other attachments which have supply and transportation

capabilities above that of the HRF (1st MEB, 2013). Even with this larger logistics package, the already strained assets become sparse in providing support to multiple decontamination, medical, staging, and sheltering sites, as well as food distribution for displaced persons.

In scenario 2, the casualty numbers are smaller, but the contamination and the psychological effects are much the same. Again, the smaller elements like the WMD-CST and the CERFP would not have much capability to transport displaced persons through decontamination to staging areas, and this would necessitate the use of more logistics-capable elements like the HRF and DCRF (Hessdoerfer 2012). In addition, anthrax carries a significant longevity in the environment due to the formation of spores (CDC 2013). This requires decontamination-capable organizations like the CERFP, HRF, and DCRF to conduct thorough decontamination of the contaminated zone. This scenario also requires follow-up analysis by the WMD-CST, TEU or other analytical-capable elements in order to restore economic and social viability to an otherwise undamaged area (DHS 2006, 2-5).

In this scenario, the analysis reveals more effectiveness by the responding elements up to the DCRF in terms of capacity than in scenario 1, but here medical response is critical to success as both affected and potentially exposed but asymptomatic persons have a need for medical treatment and prophylaxis with appropriate countermeasures (CDC 2013). As with the nuclear detonation, a biological attack precipitates these fears and burdens the decontamination and medical capacity of the responding forces. It is very difficult with anthrax to determine exposure until disease symptoms manifest (CDC 2013). Medical responders and providers would have to err on

the side of caution and treat practically everyone that came from or near the source area. This heavily strains the decontamination effort, medical effort, and logistics as it involves the need to obtain thousands of doses of medical countermeasure antibiotics (DHS 2006, 2-4). To prevent even a small possibility of people transporting hearty anthrax spores out of the affected area on contaminated clothing, responders would have to channel decontamination through very specific nodes. This necessitates a very coordinated effort to collect and process any potentially contaminated persons. As seen in the analysis, scenario 2 has implications to outpace the response capabilities of the CBRNE Enterprise elements through the DCRF, and will likely require additional support from the C2CRE or other organizations like the Public Health Service and Centers for Disease Control and Prevention (DHS 2006, 2-6).

Scenario 14 presents quite a different set of issues for response and the use of military CBRNE forces in dealing with the spread of an agricultural contaminant. The damage here is to a major economic sector of national commerce, the livestock trade, rather than to human health or physical structures. In this case, medical response is not a problem of capacity, but rather capability. The smaller forces of the WMD-CST, CERFP, and HRF do not normally carry veterinary care personnel (Reyes 2012), other than what may be available from the civilian work of the Guard members. Although this could be a source of expertise, especially in states that have significant agricultural interests, such civilian proficiency cannot be relied upon as it is not usually a primary mission of the Guard forces.

As mentioned in the analysis, the CERFP and HRF forces could be useful in decontamination of livestock sites and in preventing the spread of vectors by human and

transportation carriers, but medical personnel at this level require significant additional training to identify and deal with animal disease. The decontamination effort is substantial as many sites are involved and there is an extremely high potential for rapid spread based on the model adapted from the 2001 United Kingdom outbreak of FMD (Rubel 2003). This effort requires a coordinated multi-state effort under the auspices of a central command and control authority.

JTF-CS, in cooperation with the U.S. Department of Agriculture or other animal health entity is the most likely candidate to coordinate military support efforts. A governor could activate a dual status commander on a state-by-state basis (NORTHCOM 2012b, 4-9) with the JTF-CS providing support forces from the DCRF, C2CRE or other units to the commanders based on requests or need for a specified period of time. The dual-status commander would return them to the pool when complete. The addition of federal forces under the DCRF and C2CRE opens up the possibility to attach additional medical and veterinary care personnel that is integral to the success of the containment effort. In addition, logistics to set up the decontamination sites, inspection facilities, and animal disposal procedures is intensive, and the DCRF and other federal elements would be critical to that effort.

Additional Conclusions and Considerations

As outlined in the CBRNE Enterprise, response to such scenarios follows the concept of the smaller force responding first, then requesting larger and higher elements respond as the incident commander or JFHQ realizes the smaller force cannot handle the event. Through the request of the next echelon of forces, or activation of adjacent similar sized forces through an EMAC, the force structure and capacity grows. However, this

takes precious time to execute as certain authorities, such as the governor, must provide approval (EMAC 2013). This also applies at the federal level, where the Secretary of Defense or President must approve the use of federal forces for DSCA purposes (DoD 2012c, 3). Certain levels of response must be authorized to avoid unnecessary complication of an event, costly expenditures, and preventing violations of established law. However, in the process of moving from local through state to federal response, many different government entities become involved. This can delay and complicate the responders' ability to deploy effectively and swiftly to prevent further damage. In her article on consequence management, analyst Christine LeJeune argued that one of the complicating factors in the effective execution of consequence management by DoD forces was "a framework for horizontal integration throughout the consequence management enterprise" (LeJeune 2010). When LeJeune wrote her article in 2010, the dual-status commander concept was under consideration.

The dual-status commander concept has since been adopted (NORTHCOM 2012b, xix), a definite step toward helping to solve the National Guard-active forces command dilemma. Since adopting the dual-status concept, NORTHCOM has not had much opportunity to see it enacted, a notable exception being the Vibrant Response exercise (Burke 2013). In fact, NORTHCOM recently codified the dual-status commander standard operating procedures in January 2012, and validation of these guidelines and subsequent modification is required annually or upon the termination of a major operation (NORTHCOM 2012b, iii). As a result, further application of this concept in subsequent exercises is warranted to determine the best ways to relate the concept to a given scenario, such as those seen in the NPS and used for exercise and mission planning.

The CBRNE Enterprise is a largely Army National Guard and active Army-run model. This is not surprising as the Army not only has significant capacity in terms of personnel and equipment, but also holds the largest number of personnel trained for CBRNE events. However, the existence of a long-standing CBRNE consequence management force in the Marine Corps' CBIRF and the capabilities of other services' consequence management and CBRNE defense personnel cannot be discounted in a national-level CBRNE response concept. JTF-CS, as ARNORTH's designated joint headquarters for CBRNE and DSCA management is capable of directing forces from all services that may be required for a response (NORTHCOM 2012a).

With the advent of budgetary constraints following the drawdown of forces from Iraq and Afghanistan, and the need to shift to a more joint warfighting posture in accordance with the Goldwater-Nichols DoD Reorganization Act of 1986 (Public Law 99-433), consideration should be made to incorporating the capabilities of other services into the CBRNE Enterprise under the direction of JTF-CS. Placing the JTF under the direction of the NORTHCOM commander directly instead of maintaining it under the ARNORTH structure also provides more flexibility to the JTF to utilize joint capabilities in a more rapid manner through the NORTHCOM staff. This includes utilizing elements of both the Army CBRNE Enterprise components as well as other capable forces like the CBIRF in a joint response organization.

Recommendations

Any recommendation for altering, enhancing, or varying the structure, capabilities, capacity, or organization of the DCRF is not without potential costs and ramifications. Over the coming years, responders at every echelon will continue to evolve

the way that the active force works with and supports the National Guard components through cooperative training and exercises. However, there are options available even now for potentially creating a more effective force based on the available forces in existence.

The prior section mentioned the creation of a more joint active force response structure. The DCRF already plans for the integration of an Air Force unit, the Air Force Radiological Assessment Team (AFRAT) to support radiological survey in the event of a nuclear or radiological device event. Incorporating Air Force, Navy, or Marine Corps (and potentially Coast Guard) elements into the DCRF response concept are possible (but difficult under the current Army-centric structure). To encourage joint participation in future DSCA operations for the military in line with the Goldwater-Nichols Act, re-looking the framework of the DCRF and how it is resourced makes sense.

Joint integration and better response capacity is possible through the reorganization of the DCRF into a standing CBRNE response element much the same as the Marine Corps CBIRF. Major Nicholas Dall and Colonel Bret Van Camp advocated for this standing unit concept in prior studies (Dall 2011, 69; Van Camp 2012, 16). In Dall's thesis, he noted the potential cost, equipment, and manpower issues that might be involved (Dall 2011, 69). Likewise, Van Camp discussed how LeJeune's article had cited the difficulty in utilizing rotational units for the DCRF mission (LeJeune 2010, 5), a notion he echoed when discussing the cost effectiveness of Army force generation directed annual rotation for the MEB as the base element of the DCRF (Van Camp 2012, 25). Building the DCRF as a standing, permanent organization is not a matter of mimicking the CBIRF model but rather an evolution of the DSCA concept. In the

interests of continuity, shared understanding, joint capability, and cost savings, incorporating the CBIRF into the DCRF response concept is plausible, creating a joint organization under NORTHCOM.

Creating this joint organization takes significant planning and it is not a simple task. It does not take the CBRNE-specific response portion of the DCRF away from an Army unit and reassign it to the CBIRF. Rather, it places the additional asset of the CBIRF under the reorganized joint element that would combine the capabilities of the DCRF and CBIRF and allow joint training, equipping, and contingency planning to occur. This allows a modicum of flexibility in providing forces for other requirements, such as support to special events, smaller scale responses, and the allocation of forces to regional collaborative training events on a smaller scale as Vibrant Response while building ties with state level responders. This joint CBRNE response force maintains its current mandate, but rather than operate on a rotation between MEBs, it becomes a single, permanent brigade-sized entity. This unit could organize in a similar way to the MEB with assigned forces in the disciplines necessary for homeland response under DSCA. It then becomes available both as a CBRNE force and for other civil support functions.

The Army is currently undergoing a change to identify and designate regionally-aligned brigades to various geographic combatant commands (Griffin 2013). In turn, this standing DCRF organization could become the regionally-aligned brigade under NORTHCOM, allowing for training to be oriented specifically to national response needs and undertaking exercises and partnering opportunities. In addition, the standing force could seek opportunities to work regularly with non-governmental organizations like the

American Red Cross on disaster relief operations. Continuing to place this organization under the direction of JTF-CS during an emergent response in the United States is possible as it provides a sub-unified command and control for the joint force and any eventual augmentation. ARNORTH could continue to be the Army component force provider for JTF-CS. However, in the event of the response requirement, the JTF should report to NORTHCOM directly (and thus to the Secretary of Defense and President) for chain of command purposes.

Using this force structure does three things to enable a more effective response. First, this permanent DCRF concept allows for a standing unit that is aligned to NORTHCOM homeland defense objectives and provides a unit that is dedicated to response. By rotating personnel in and out of the unit for a defined period of time, this allows for a much higher level of training opportunity, knowledge retention, and continuity. For example, personnel could be rotated in to the brigade organization for four years and assigned a personnel code (such as a "Whiskey" identifier) that holds them in the assignment for a defined period. The brigade can screen a service member wishing to obtain assignment for suitability, much the same way as is done in other units like the CBIRF (Broyles 2009, 20). This ensures the individual was a good fit for the demanding position of consequence management response. This unit then maintains a standing core of personnel who ensure continuity in the planning, chemical response, decontamination, engineering, and logistics functions.

In a brigade-sized element, enlisted personnel have room to professionally develop and obtain promotion. Commanders at company, battalion, and brigade levels could continue to rotate per normal timelines for command positions and other officer

staff positions could be filled per nominal timelines, or prior to and after command if available. Army Forces Command could attach medical and aviation support to the DCRF on a two-year basis, providing for some continuity but also allowing for force generation planning and utilization elsewhere (JTF-CS 2012). This attached support does not have to be specific to the Army if a suitable organization were available from another component, but the Army may still fill the majority of the requirement due to availability of forces. That would still provide an opportunity for training and exercising together for the two year period, and create a greater force pool in the military as a whole that had experience in working with CBRNE and homeland defense mission experience.

Second, this structure eliminates the need for a rotation between multiple units (Dall 2011, 69). Doing so not only increases operational tempo for the unit, but compounds the requirements for the brigades as they are required to maintain both a DCRF mission and a regular deployable mission focus. As expressed by Van Camp, the MEB structure is a good candidate for the mission type (Van Camp 2012, 19). Modeling the regionally-aligned force on the MEB is plausible and prudent. However, eliminating the need for force generation cycles, on-off cycle training, and transferring mission-specific equipment enables the joint brigade to maintain trained forces, continuity, and would lower overall cost (Van Camp 2012, 25). In addition, the unit can undertake regional-level exercises to maintain skills and partnerships with a portion of the force while retaining the majority in a ready-available state. The brigade commander can use national level exercises such as Vibrant Response annually to validate proficiency (Burke 2013), planning such exercises in a way to allow for rapid redeployment of the element to another area from the training site if the need arose.

Third, having the majority of the joint response brigade in a single location cuts down on costs and travel for training. Co-location of forces reduces the requirement to gather forces from multiple locations for initial deployment to an incident. To a certain extent, the DCRF as it stands now can deploy some elements from its organic force, but organizing so the main core of that force is co-located will save considerable response time and possibly lives. Neither MEB has an available chemical battalion currently co-located at its duty station. Long-term assignment of a chemical battalion to the joint response brigade would allow for the core effort of CBRNE assessment and decontamination to go out with the first phase of troops in a response.

In 2013, the 23rd Chemical Battalion is scheduled to move from Joint Base Lewis-McChord to South Korea to support consequence management and CBRNE functions for the Korean theater of operations (2ID PAO 2013). In doing so, the battalion took on a company of technical escort CBRNE response teams to provide assessment and mitigation capability. Future combat support chemical battalions may have TEU attachments to them, and in this case, the assignment of a chemical battalion would also provide that capability to the joint brigade. Also having the current elements of an engineer battalion and brigade support battalion with the joint brigade maintains the ability to sustain and provide critical civil support functions to the initial response (Van Camp 2012, 23).

Understandably, it may not be possible to have the entire medical or aviation element co-located, but proper planning can decrease the amount of coordination time to get such units in place for phase II deployment according to the CBRNE Enterprise framework (Hessdoerfer 2012). The follow-on capabilities of the C2CRE could also be

easily incorporated into the joint structure under the command of the JTF using this framework, possibly eliminating the need for a separate JTF headquarters to control follow-on active forces.

Another recommendation arises from the NPS analysis itself. In the first two scenarios, the incidents involved a terrorist action with a CBRNE threat against human populations, either a nuclear device or a human biological agent (DHS 2006). Both require technical training to support consequence management activities, especially as they pertain to detection and analysis capabilities. Maintaining knowledge on the use of detection instrumentation is critical to mission objectives. However, in both cases, medical assets will be heavily taxed and thorough instruction on identifying the signs and symptoms for radiation sickness and anthrax disease will be important for medical personnel at all levels. Responders must identify those persons requiring immediate medical intervention to appropriate providers as soon as possible and identify those without active disease or radiation effects to free up medical assets. Even without symptoms, many people assume they are affected but this will easily overburden the capabilities of medical personnel at all levels. Early identification and triage is necessary to ensure providers treat those most affected early. Specialized training of medical responders at all levels is important, specific to the types of injuries and signs or symptoms they might encounter in CBRNE scenarios (Benjamin et al. 2009, 55).

The Foot-and-Mouth Disease scenario presents a different challenge as planners do not often consider agricultural diseases as part of regular CBRNE training, but these diseases present a significant threat. Training on this type of scenario in at least a regional setting (especially in those areas with significant agricultural interests) should be done at

least every few years to maintain awareness of the threat and the potential response procedures for it. In addition, enlisting the aid of the United States Department of Agriculture in helping to train military responders on decontamination for agricultural diseases and working with medical personnel on identifying animal and plant disease will prevent serious delays and mistakes when responding to a major agricultural incident. This takes a concerted effort to form a lasting partnership between the military response elements and associated civilian agencies, as they are far more knowledgeable and capable in this type of emergency.

Suggestions for Further Study

Research was not conducted on the particular costs of one CBRNE response framework or system versus another or on the financial burden of any alternatives. Further study in the cost considerations of implementing federal response for the various NPS scenarios, the reimbursement requirements, and the financial ramifications of use of any of the particular elements would be an important area for follow-up study.

In addition, anticipating the consequences of funding additional training for the DCRF, C2CRE or other active component entities versus not funding them was not possible in this thesis. The research did not include any alternative structures due to potential fiscal constraints facing the military services. An investigation into the costs involved in additional training, or the consequences of cutting funding for existing force training could prove valuable in planning future a future response framework. The consequences of further force reductions on the organization of any of the CBRNE Enterprise elements were also not a part of the research. Any major reduction to the force structure at the state or federal level could further overburden the remaining elements,

leading to a significant delay in response, less capacity to support operations, or the inability to assist in all areas of the prescribed mission. Studying the effect of potential force reductions on the DCRF and C2CRE may be useful in demonstrating the importance of adequate manning and equipping for this critical contingency force. In addition, further research on the psychological aspects of CBRNE events could help to determine the effect of such deleterious factors on CBRNE capabilities and capacities, including those at the federal level.

Conclusion

The analysis and evaluation suggests that the DCRF and subsequent C2CRE components of the CRBNE Enterprise are useful and necessary components. The force as it is structured has capacity gaps when compared against the accepted national-level scenarios for response planning. This presents the potential for risk when planning for the possibility of a major national-level event such as those seen in the NPS. Such scenarios, when compounded by the potential physical damage, economic, and psychological effect could have implications for national security if not managed effectively and with adequate capacity to ensure a desired outcome like those outlined in the *National Preparedness Guidelines*. There is also the potential for risk at the national policy level as strategic documentation such as the NSCWMD and NMSCWMD address end states for combating WMD and CBRNE consequence management but do not outline the means by which these objectives are accomplished. Recommendations for enhancing DCRF capacity, with the concurrent increases in capability have been made and could present a way forward in addressing such policy imbalance, national security risks and

building a more effective CBRNE response framework for the active duty military in supporting local, regional and state responders and National Guard organizations.

Further exercising of the CBRNE response elements collectively is warranted and necessary to develop the lessons learned for future planning and force utilization. Annual exercises to bring some of the elements together may not be enough to ensure efficient and effective coordination, especially with the civilian agencies that will be leading an overall response effort (Schlafer 2013). Cooperation with FEMA, other DHS components, state emergency management agencies, and local departments and authorities is important for testing and building response capacity and imperative for success on the day that CBRNE capability is required for real. The military continues to train for its multiple missions, be they at home or abroad, but with the reduction in overseas missions and the potential for further budget and force reductions in years to come, it is important to look at alternatives now and plan for the most effective way to use the assets available in an integrated, joint manner.

GLOSSARY

CBRNE (Chemical, Biological, Radiological, Nuclear and high-yield Explosives)–those weapons, systems, devices, incidents or events with a specific component or element that potentiates their effect through the use of chemical or toxic material, biologic or etiologic agents (both animal and agricultural), radiological elements or radioisotopes with the possibility of irradiating or contaminating persons or places, devices that produce a supercritical nuclear yield, or possessing such a degree of explosive potential as to create mass devastation through heat, blast or shock (from Joint Publications 3-28 and 3-40).

CBRNE Enterprise–the collection of Title 10 (active-duty) and Title 32 (National Guard) CBRNE assets and their roles in response for domestic operations. This includes the task organization, capabilities, and operational protocols of typical Title 10 and Title 32 response units, supporting local, State and Federal agencies (adapted from Hessdoerfer 2011 and Reyes 2012).

Chemical, Biological, Radiological, and Nuclear Consequence Management–Activities undertaken when directed by the Secretary of Defense or the President to reduce the effects of deliberate and inadvertent releases of chemical, biological, or radiological materials or nuclear detonations (from Chairman of the Joint Chiefs of Staff (CJCS) Instruction 3125.01).

Civil Authorities–Those elected and appointed officers and employees who constitute the government of the United States, the governments of the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, United States possessions and territories, and political subdivisions thereof (from FM 3-28).

Defense Coordinating Element–Department of Defense single point of contact for domestic emergencies. Assigned to a joint field office to process requirements for military support, forward mission assignments through proper channels to the appropriate military organizations, and assign military liaisons, as appropriate, to activated emergency support functions. Also called DCO (from FM 3-28).

DSCA (Defense Support to Civil Authorities)–Support provided by U.S. Federal military forces, Department of Defense (DoD) civilians, DoD contract personnel, DoD component assets, and National Guard forces (when the Secretary of Defense, in coordination with the governors of the affected states, elects and requests to use those forces in Title 32, United States Code, status) in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events (from FM 3-28).

TIC/TIM (Toxic Industrial Chemical/Toxic Industrial Material)–any chemical or substance which by its nature can cause harm to living organisms or have the

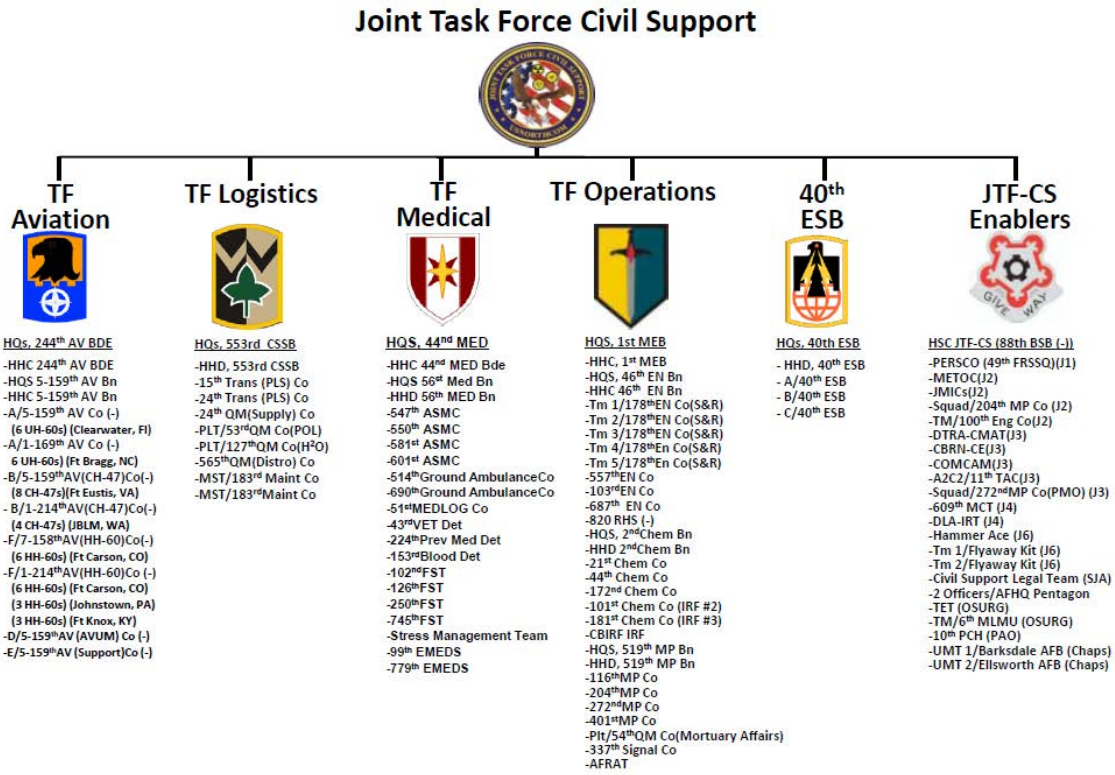
potential to contaminate the environment in such a manner as to cause destruction. This consists of poisonous, toxic, noxious, and incapacitating substances that can have an effect on public health. These include common substances used in commercial and industrial applications that could be utilized for purposes outside their intended or labeled use to cause damaging effects .

WMD (Weapon of Mass Destruction)–a weapon, by its inclusion of CBRNE materials or elements, is intended to cause massive destruction, contamination, disruption, terror, or economic impact with associated deleterious effects to a population or place. A WMD does not necessarily have to cause immediate physical damage; it may cause delayed or long-term damage to a population or place, as may be possible by the use of radiological dispersion devices (RDD) or a biological weapon (from Joint Publication 3-40).

APPENDIX A

JOINT TASK FORCE–CIVIL SUPPORT ORGANIZATION CHART AS OF

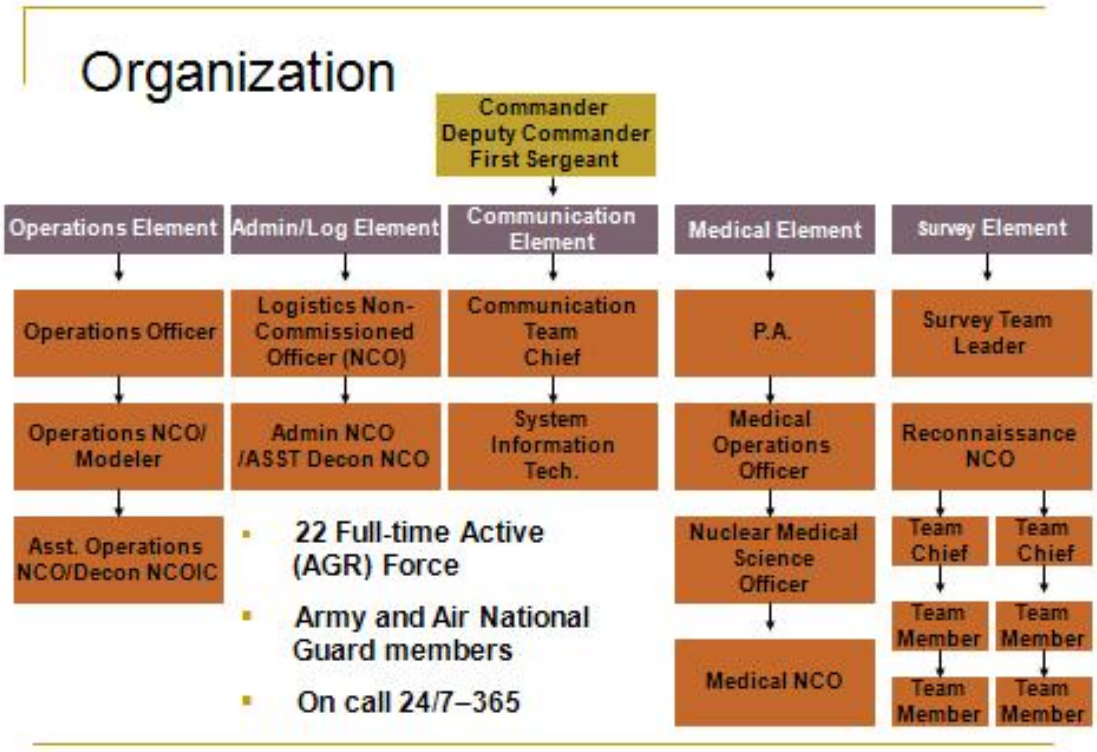
NOVEMBER 2012



Source: Joint Task Force–Civil Support, JTF-CS 101 Brief (San Antonio, TX, United States Army North, 2012), slide 13, http://www.jtfcs.northcom.mil/Documents/JTFCS101Briefv1.0(29Nov2012).pdf (accessed March 12, 2013).

APPENDIX B

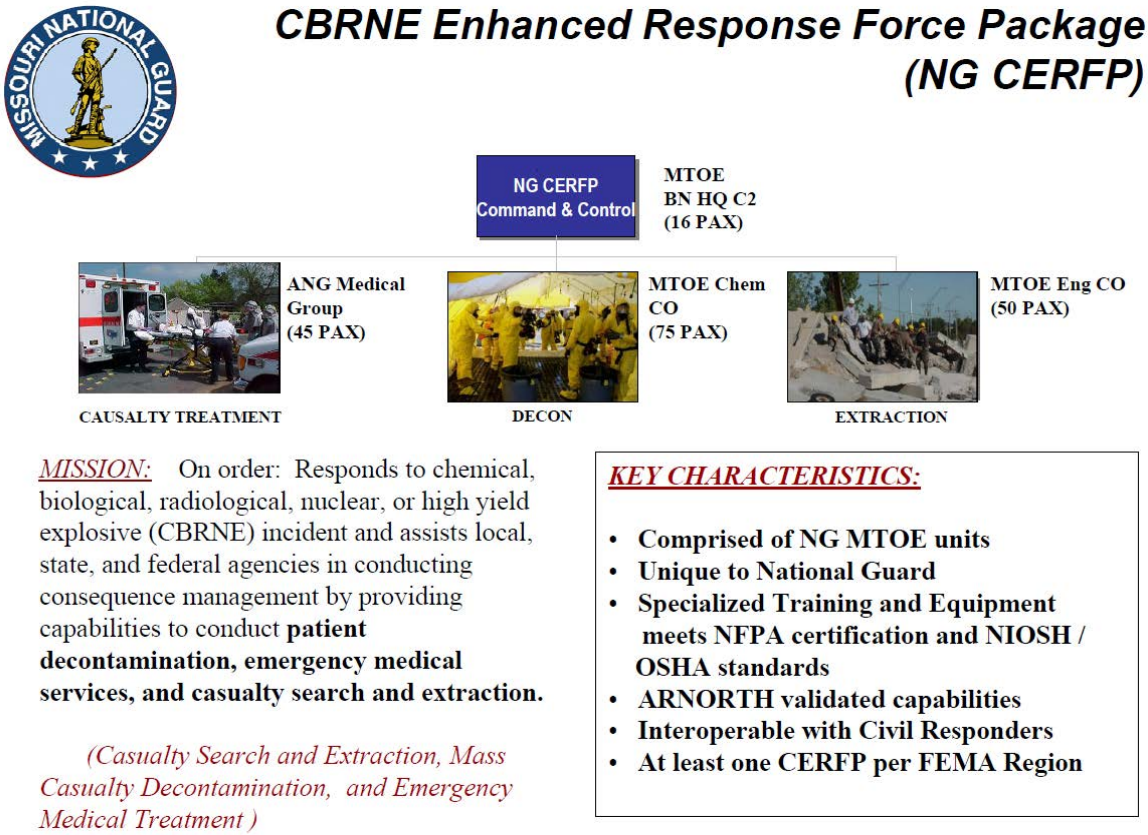
WMD-CST TEAM ORGANIZATION



Source: Captain Holly Shenefelt, Weapons of Mass Destruction: A Coordinated Response Effort (84th Civil Support Team, Wyoming National Guard and the University of Washington Northwest Center for Public Health Practice, 2007), http://www.nwcphp.org/training/opportunities/webinars/weapons-of-mass-destruction-a-coordinated-response-effort (accessed March 11, 2013).

APPENDIX C

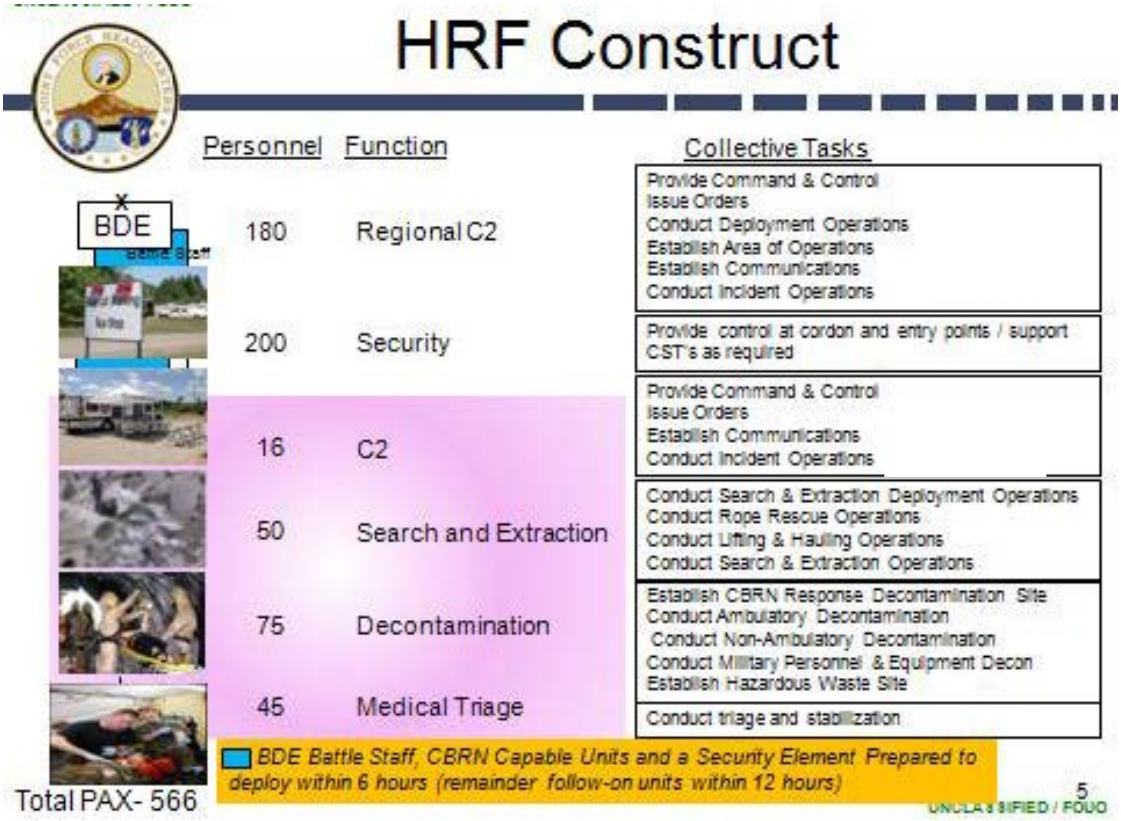
MISSOURI NATIONAL GUARD CERFP STRUCTURE



Source: Major General King E. Sidwell, Missouri National Guard Consequence Management: Capabilities, Challenges and Opportunities (Missouri National Guard Joint Force Headquarters (JFHQ), 2008), http://www.dtic.mil/ndia/2008maneuver/Sidwell.pdf (accessed January 24, 2013).

APPENDIX D

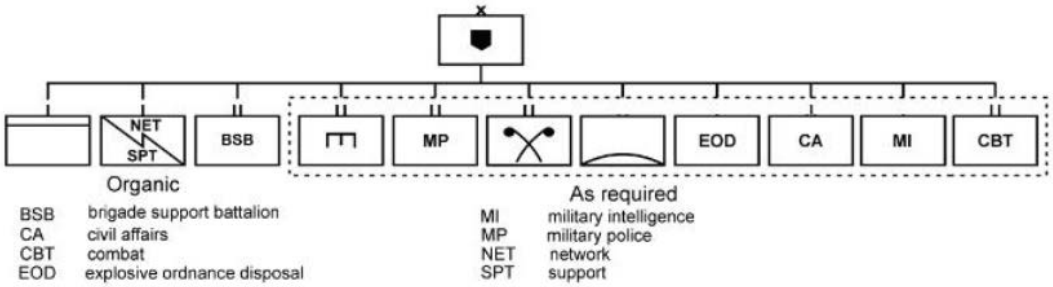
HRF CONSTRUCT



Source: Joint Force Headquarters (JFHQ), WA ARNG, Washington Homeland Response Force Construct (Washington Army National Guard, 2012), http://www.docstoc.com/docs/111857226/Washington-Homeland-Response-Force-Construct (accessed March 7, 2013).

APPENDIX E

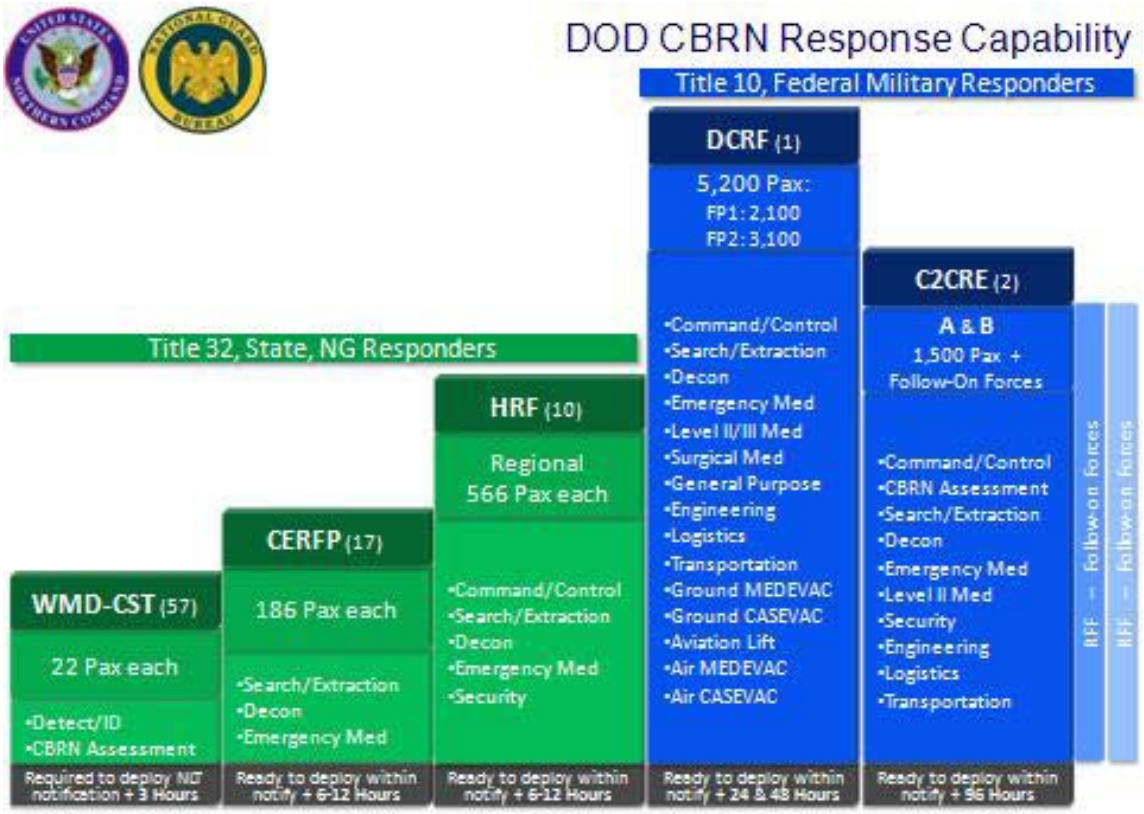
MANEUVER ENHANCEMENT BRIGADE STRUCTURE



Source: Department of the Army, Field Manual 3-90.31, *Maneuver Enhancement Brigade Operations* (Washington, DC: Government Printing Office, 2009).

APPENDIX F

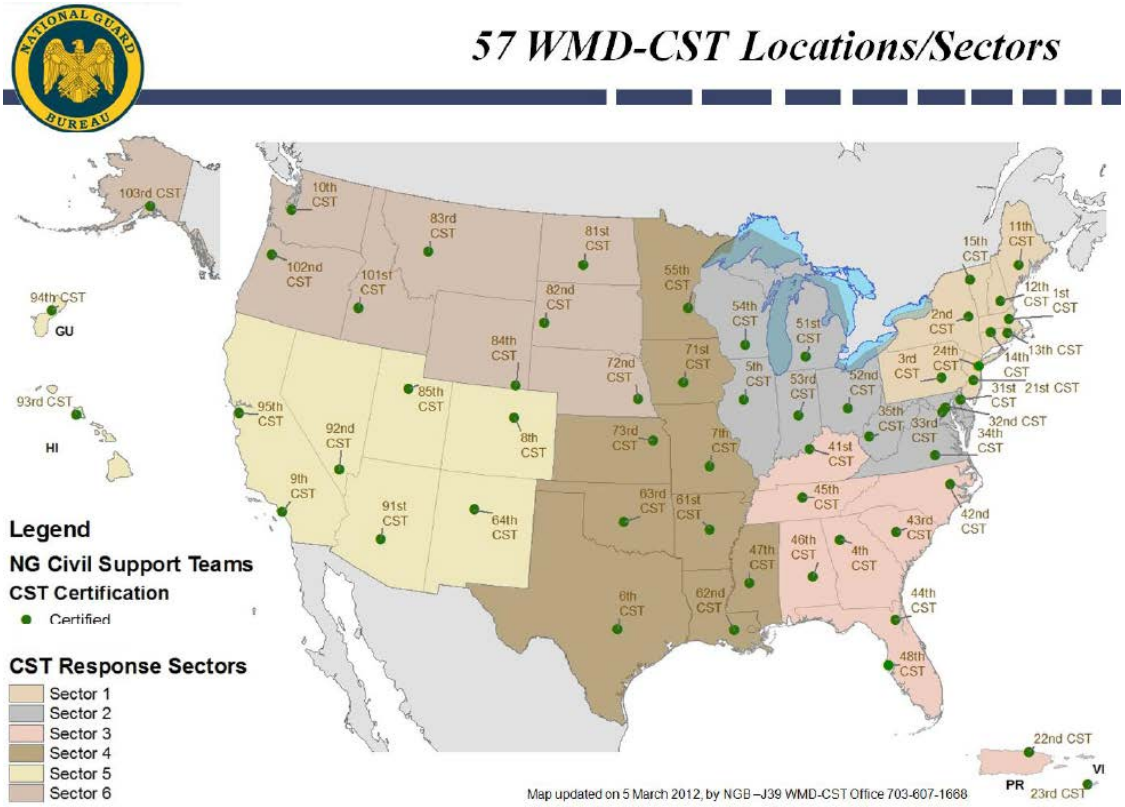
DOD CBRNE ENTERPRISE RESPONSE CAPABILITIES



Source: Ron Hessdoerfer, CBRN Response Enterprise (Colorado Springs, CO: United States Northern Command N/NC-J71, 2011). Obtained from United States Northern Command CBRN Section, December 2012).

APPENDIX G

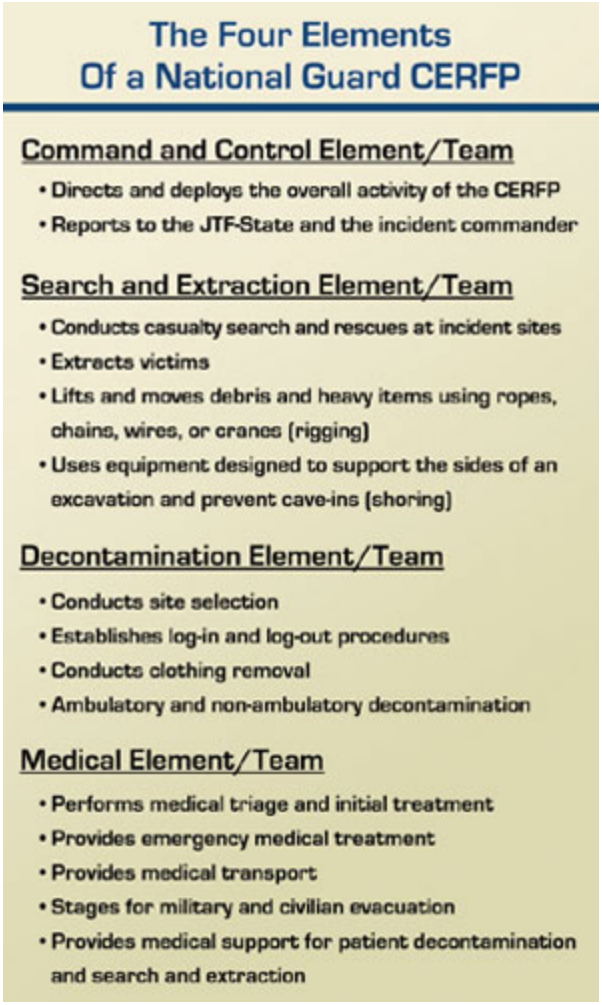
WMD-CST LOCATIONS IN THE UNITED STATES



Source: Colonel Heinrich Reyes, CBRN Response Enterprise (Washington, DC: National Guard Bureau, March 2012), http://www.dtic.mil/ndia/2012CBRN/Reyes.pdf (accessed December 8, 2012).

APPENDIX H

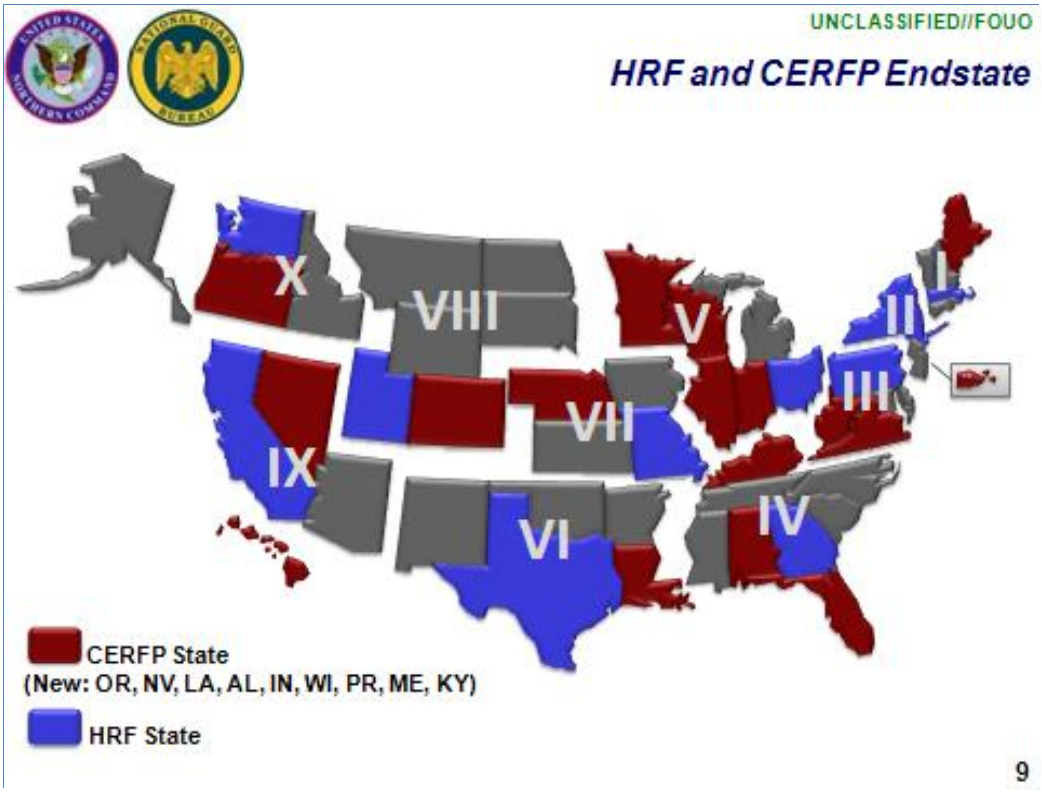
CERFP ELEMENTS AND FUNCTIONS



Source: Jonathan Dodson, CERFPs: The Essential Elements, Domestic Preparedness Online, http://www.domesticpreparedness.com/ Government/National_Guard/ CERFPs%3A_The_Essential_Elements (accessed March 8, 2013).

APPENDIX I

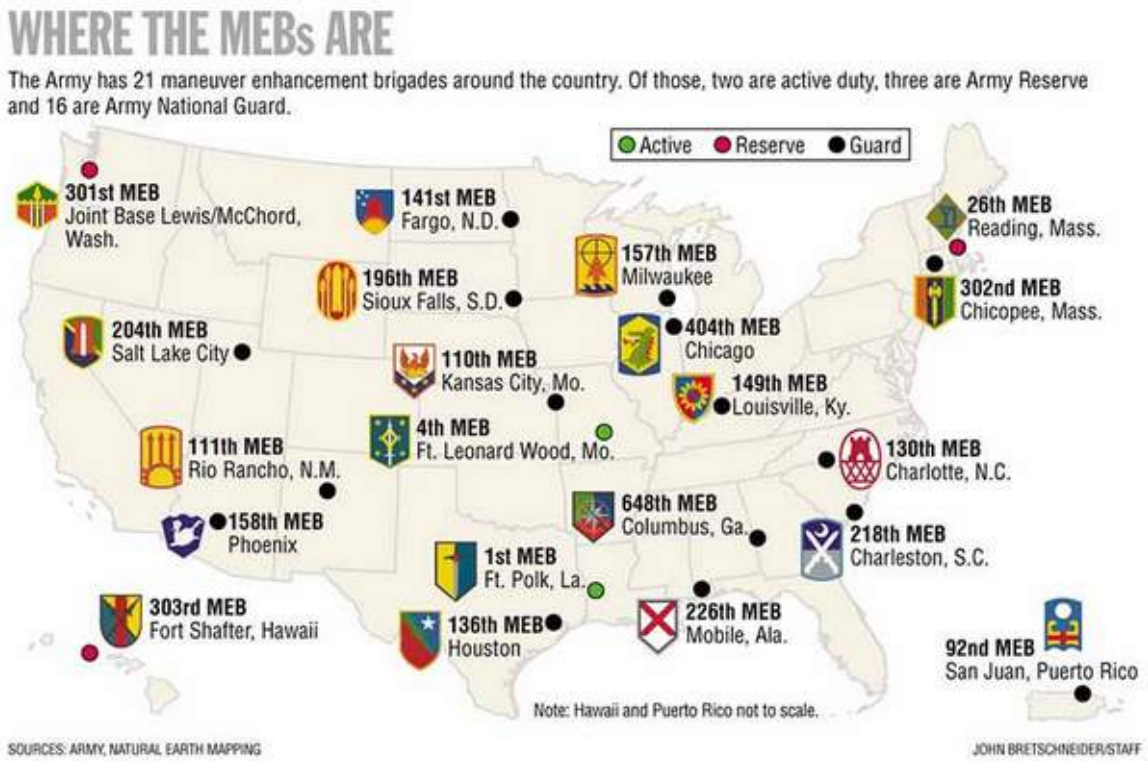
HRF AND CERFP STATE LAYOUT



Source: Ron Hessdoerfer, CBRN Response Enterprise (Colorado Springs, CO: United States Northern Command N/NC-J71, 2011). Obtained from United States Northern Command CBRN Section, December 2012.

APPENDIX J

MANEUVER ENHANCEMENT BRIGADE LOCATIONS



Source: John Breitschneider, "Where the MEBs Are," *Army Times*, April 2012, http://www.armytimes.com/apps/pbcs.dll/article?AID=2012204240335 (accessed February 14, 2013).

APPENDIX K

EMERGENCY SUPPORT FUNCTIONS

ESF #1 – Transportation ESF Coordinator: Department of Transportation
• Aviation/airspace management and control • Transportation safety • Restoration and recovery of transportation infrastructure • Movement restrictions • Damage and impact assessment
ESF #2 – Communications **ESF Coordinator: DHS (National Communications System)**
• Coordination with telecommunications and information technology industries • Restoration and repair of telecommunications infrastructure • Protection, restoration, and sustainment of national cyber and information technology resources • Oversight of communications within the Federal incident management and response structures
ESF #3 – Public Works and Engineering **ESF Coordinator: Department of Defense (U.S. Army Corps of Engineers)**
• Infrastructure protection and emergency repair • Infrastructure restoration • Engineering services and construction management • Emergency contracting support for life-saving and life-sustaining services
ESF #4 – Firefighting **ESF Coordinator: Department of Agriculture (U.S. Forest Service)**
• Coordination of Federal firefighting activities • Support to wildland, rural, and urban firefighting operations
ESF #5 – Emergency Management **ESF Coordinator: DHS (FEMA)**
• Coordination of incident management and response efforts • Issuance of mission assignments • Resource and human capital • Incident action planning • Financial management
ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services **ESF Coordinator: DHS (FEMA)**
• Mass care • Emergency assistance • Disaster housing • Human services
ESF #7 – Logistics Management and Resource Support **ESF Coordinator: General Services Administration and DHS (FEMA)**
• Comprehensive, national incident logistics planning, management, and sustainment capability • Resource support (facility space, office equipment and supplies, contracting services, etc.)

ESF #8 – Public Health and Medical Services ESF Coordinator: Department of Health and Human Services
• Public health • Medical • Mental health services • Mass fatality management
ESF #9 – Search and Rescue **ESF Coordinator: DHS (FEMA)**
• Life-saving assistance • Search and rescue operations
ESF #10 – Oil and Hazardous Materials Response **ESF Coordinator: Environmental Protection Agency**
• Oil and hazardous materials (chemical, biological, radiological, etc.) response • Environmental short- and long-term cleanup
ESF #11 – Agriculture and Natural Resources **ESF Coordinator: Department of Agriculture**
• Nutrition assistance • Animal and plant disease and pest response • Food safety and security • Natural and cultural resources and historic properties protection • Safety and well-being of household pets
ESF #12 – Energy **ESF Coordinator: Department of Energy**
• Energy infrastructure assessment, repair, and restoration • Energy industry utilities coordination • Energy forecast
ESF #13 – Public Safety and Security **ESF Coordinator: Department of Justice**
• Facility and resource security • Security planning and technical resource assistance • Public safety and security support • Support to access, traffic, and crowd control
ESF #14 – Long-Term Community Recovery **ESF Coordinator: DHS (FEMA)**
• Social and economic community impact assessment • Long-term community recovery assistance to States, tribes, local governments, and the private sector • Analysis and review of mitigation program implementation
ESF #15 – External Affairs **ESF Coordinator: DHS**
• Emergency public information and protective action guidance • Media and community relations • Congressional and international affairs • Tribal and insular affairs

Source: United States Department of Homeland Security, *National Response Framework* (Washington, DC: Federal Emergency Management Agency, January 2008).

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